August 23, 1948

# STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 37

SPECIAL FINISHES

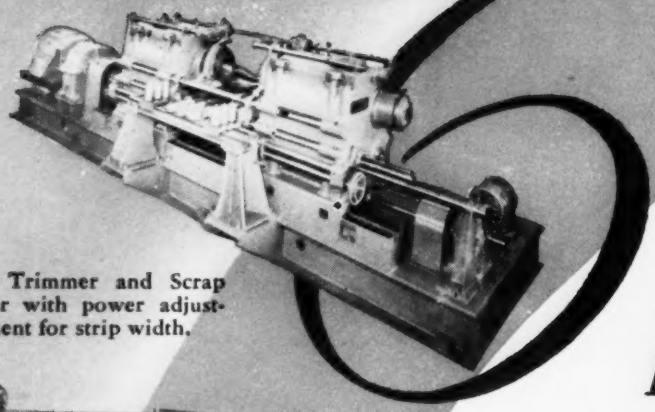
Most tempers, as desired in cold rolled strip steel, can be obtained in pre-coated THOMASTRIP

Thomas Ship
COLD ROLLED STRIP STEEL
REG. U. S. PAT. OFF

ELECTRO-COATED ZINC, COPPER, NICKEL, AND BRASS . . . HOT DIPPED TIN AND SOLDER . . . LACQUER COATED IN COLORS . . . UNCOATED PRECISION STRIP, CARBON AND ALLOY SPECIALTIES.

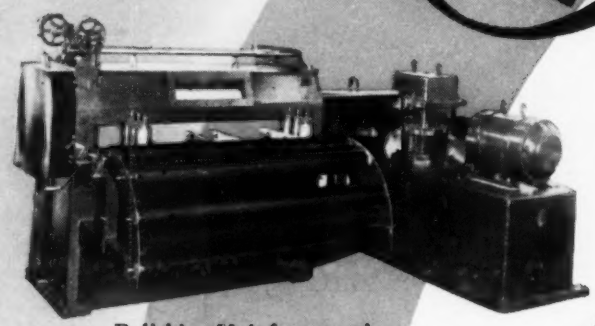
THE THOMAS STEEL COMPANY · WARREN, OHIO

COLD ROLLED STRIP STEEL SPECIALISTS



Side Trimmer and Scrap Cutter with power adjustment for strip width.

# *good items in Equipment for Flat-Rolled Products*



Polishing Unit for a continuous terne line with motor driven buffing wheels.

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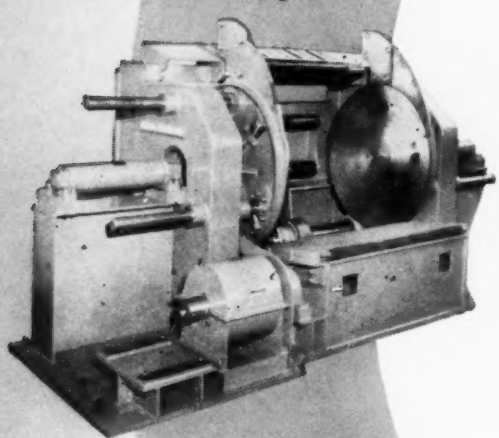

Coil box with air operated rotating disc side guides, and driven cradle rolls.

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YOUNGSTOWN, OHIO

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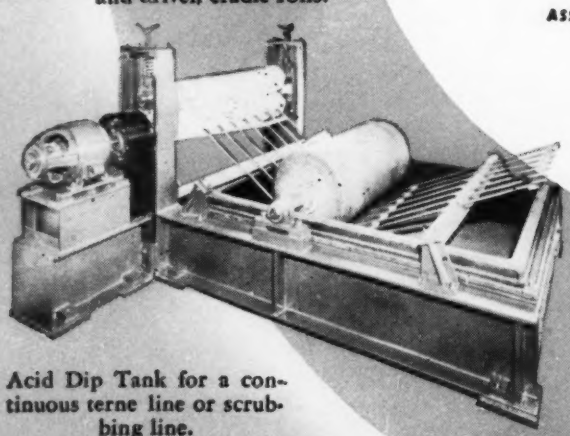
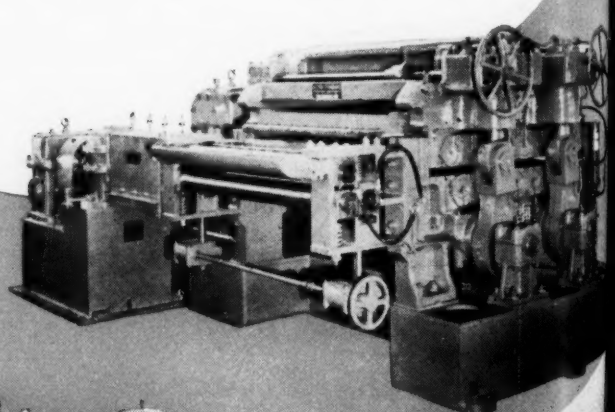
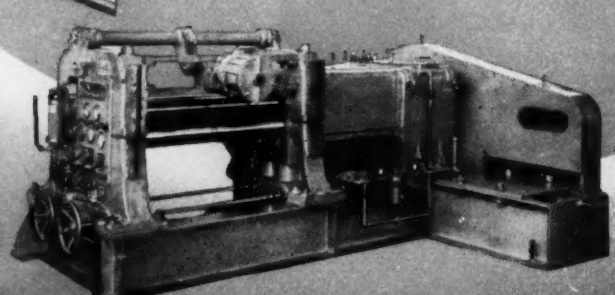


Acid Dip Tank for a continuous terne line or scrubbing line.



Pull-through Leveller or Scale Breaker with uncoiling feed-in unit.



5½" Roller Leveller or Uncoiler for various continuous processing lines.

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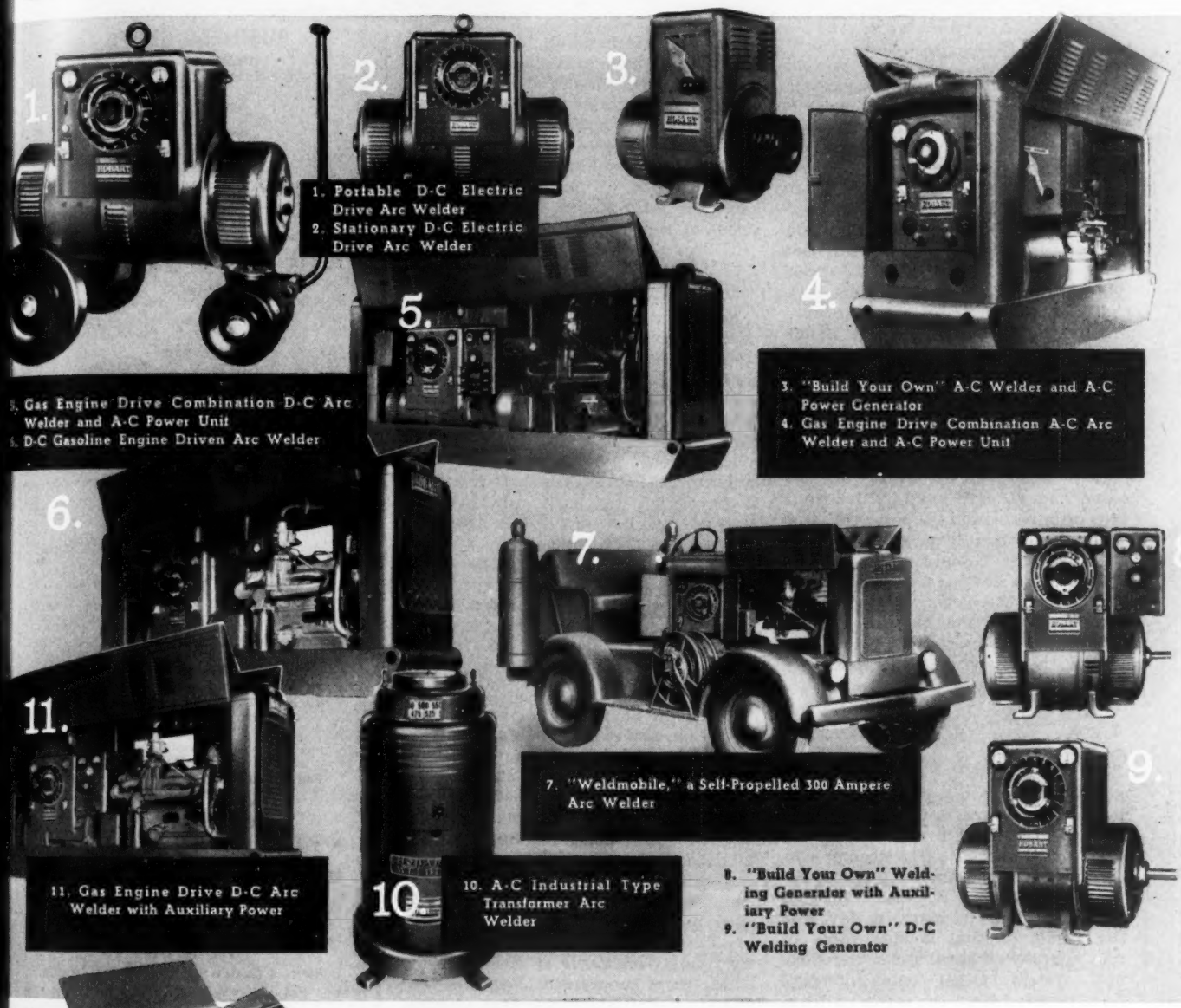

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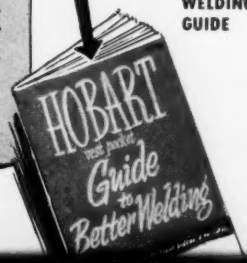


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# Behind the Scenes . . .

## New War Correspondents

As usual, our editors are checking all the news hot-spots for you. One of those is the "new wartime Washington". Now we would hesitate to be classed as warmongers, or even harbingers of conflict, whatever that means. Nevertheless, last week's lead article was an indication of the type of stuff you may well see from now on. Some of the boys who have been covering the Washington scene say that many familiar faces are appearing around the old State Dept. building, faces which were much in evidence in the years 1942-45. Hotel rooms are again on the tough list down there, and train and plane reservations are reverting to the all-too-familiar pattern. Many men of industry are already back on the scene and already cussing the tight tape of bureaucracy, as program after program starts rolling. As usual, you will find the complete tale of the goings-on in STEEL, where our boys will report the news, the news behind the news, the men behind the news, and the men behind the men behind the news. For our part, we will still be sitting here Behind the Scenes (advt.).

## Credit Dept.

While we are in a giving mood, we want to be sure and remember to give special credit to our editors for the several special extra accomplishments which are currently being applauded by you readers. Biggest chunk of mail in many a day was the result of that 2-page table of mill sources of steel under the f.o.b. mill system. Other bales of mail have resulted from the series on forging and the series on organic finishes. Now we are in the midst of a snowstorm of paper resulting from the tool steel series, and we are advised by the staff upstairs that they are in the midst of an opus on steel prices which will be the natural successor to the f.o.b. mill table.

## Advertising Lore, For Free

From time to time we publish messages prepared by our own association, the Associated Business Papers, in STEEL. There is probably no other group which collectively knows more about effective industrial advertising than the members of the ABP. From their storehouses of information have come a number of booklets, leaflets, pamphlets, and other kinds of lets with much advertising knowledge in them. All this build-up leads to the fact that we have available for distribution for free some of this material, including reprints of the entire series of ads, booklets on "How Much Does NO Advertising Cost?", "Nobody Profits Until Something Is Sold" and "So You Want To See Results?". Be happy to send copies to anyone desirous of same.

## Sunday Morning in Iowa

From out in Iowa comes an admission from A. G. Osmundson that he gets up early Sundy morning to read STEEL. We are, of course, accustomed to great love for that particular magazine, but perhaps that's carrying it a little too far. Besides, most of our readers don't get the copy until Monday, which is the day that we get up early to read it. However, we bow low in the direction of Webster City, Iowa, and we assure Mr. Osmundson that we will keep the copies coming, especially since he sent along 15 bucks for a renewal of his subscription.

## Puzzle Corner

When the boys were all rearranged on the seesaw two weeks ago, Allen was sitting 37½ inches from the center point. He weighs 32 pounds, while Robby tips the beam at 60 pounds. And a couple of workers out at Heckethorn Mfg. & Supply Co., Littleton, Colo., whose names are Raymond Breer and John Guenthner claim that the answer to our reference book equation is equal to the m.p.h. of the Alpine climbing butterfly flying backwards at 5000 feet altitude in a snowstorm. Must be the mountain air in Colorado that creates such situations. Our most reliable answerer, H. C. Osborne of Racine, Wis., is still coming in with the right answers week after week. Let's see how you can do on this: The president of a gear making concern asked his sales manager for a comparison of the week's sales in two adjoining counties on one item in their line. The two figures were $3,893.93 in county A and $8,311.19 in county B. Being a former statistician, the president scribbled a few numbers on his scratch pad and came up with the number of units sold in each of the two counties, although he didn't know the selling price of that particular item. Can you do as well?

Shrdlu

(Editorial Index—page 37)

STEEL

Vol. 123—No. 8 August 23, 1948

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Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio. E. L. SHANER, President and Treasurer; G. O. HAYS, Vice President and General Manager; R. C. JAENKE, Vice President; F. G. STEINBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer. Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1948 by the Penton Publishing Co.

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**Advantages of Chromium Plating**

**Fundamentals of Forging Practice—Part VII**

**Economics of Adirondack Iron Ore Mining**

**Tool and Die Materials—Selection, Application—Part III**


# STEEL

***The Magazine of Metalworking and Metalproducing***

VOL. 123, NO. 8 — AUGUST 23, 1948


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# AUSTENITIC STAINLESS STEELS MAY DO IT BETTER...

Hundreds of companies are today setting new standards of low-cost performance through the judicious use of austenitic chromium-nickel stainless steels.

By redesigning these stainless chromium-nickel alloys often permit making parts much lighter in weight, while still providing ample structural strength.

Not only can you trim bulk and deadweight by using chromium-nickel stainless . . . you can assure longer service life because these alloys are resistant to attack by nearly all oxidizing acid conditions.

In elevated temperature service they resist creep, scaling or oxidation, and at low temperatures they remain tough and offer exceptional resistance to impact.

You can draw, spin, forge, weld, solder, punch, shear or bend chromium-nickel stainless steels.

They are used where you need high resistance to corrosion and heat, along with good resistance to impact, wear and abrasion. They assure long, trouble-free performance of equipment, the appeal of beauty and durability in decorations, hygienic cleanliness as well as economy in food, drug, chemical and other process industries.

Leading steel companies produce austenitic chromium-nickel stainless steels in all commercial forms. A list of sources of supply will be furnished on request.

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Over the years, International Nickel has accumulated a fund of useful information on the properties, treatment, fabrication and performance of engineering alloy steels, stainless steels, cast irons, brasses, bronzes, nickel silver, cupro-nickel and other alloys containing nickel. This information is yours for the asking. Write for "List A" of available publications.

**THE INTERNATIONAL NICKEL COMPANY, INC.** 67 Wall St., New York 5, N.Y.

August 23, 1948

# Out of Step!

According to reliable indicators, the nation is at a new peak in business activity. Of its almost 64 million individuals available for work, nearly 62 million are gainfully employed—many at unprecedentedly high wages. While companies in some lines of business are operating below capacity, the average for industry as a whole is high and in some branches supply is far short of demand. Farmers are prosperous and they look forward to larger than normal crops this year.

From these and otner signs of the times, one would be tempted to say that the country is enjoying a highly satisfactory state of prosperity, yet this is far from the truth. The number of informed persons who are satisfied with the present state of affairs is small compared with the number of those who are dissatisfied. In fact, widespread apprehension is prevalent among persons in all walks of life.

In most cases this apprehension comes from the feeling on the part of an increasing number of people that booming activity, which looks attractive on the surface, is dangerously artificial. Too many segments of our economy are supported by shaky props. Too much of the dollar value by which we measure production, sales, wages and profits is fictitious. To add to our concern, our government administration seems impotent to deal with the problems that cause our anxiety. Instead, it wants to continue measures which have contributed to the present state of artificiality.

Some industrial corporations have tried independently to slow the pace of inflation. Because this was sporadic and not concerted action, it failed. Today, aside from some feeble anti-inflation measures authorized by Congress, the chief remedies in sight are those arising from individual action of the people and from automatic action of natural economic forces.

Fortunately the influence of both of these is beginning to be felt. It will increase. Fewer people are spending recklessly. Industry is examining expansion projects more critically. All along the line—where the judgment of individuals prevails—there is a stronger tendency to tighten belts.

Unfortunately the federal government pursues the opposite course. By its actions one would think it is trying to fight deflation. It should get in step with the people.

* * *

**NO SUDDEN SHIFT DUE:** Comparison of facilities and rates for rail, truck and water transport in the Chicago area indicates that drastic changes in the method of shipping steel, resulting from mill pricing or any other factor, will not develop over-night.

The situations with respect to two steel producers support this conclusion. Present loading facilities at one mill limit truck and water shipments to about 15 per cent of the total movement. At the other mill, from the first of the year, rail shipments have been 60 per cent of the total, truck shipments 35 per cent and water shipments 5 per cent.

Rail, truck and water rates on finished steel shipments from the Chicago area are not as uniformly favorable to truck and water transport as one might expect. To the attractive Detroit market the rates per net ton are $8.80 for all-rail, $5.80 for truck and $5.20 for water. To St. Paul they are $11.80 by rail, $13.20 by truck and $8.47 by water. Apparently the trucking rate, which holds a competitive advantage on certain short hauls, loses that advan-

(OVER)

tage on long hauls. Also the advantage that one would expect water carriers to enjoy is lessened considerably by substantial terminal charges at both ends of the trip.

The pattern of transportation costs is complex. As consumers seek the most advantageous routing under mill pricing, they will find that each mill-to-destination shipment must be judged on its own merits. Somebody—probably the mill—long ago figured out the most economical way to ship. —p. 45

* * *

**MESS WAS AVOIDABLE:** No point will be gained by trying to determine who outsmarted whom in the cloudy negotiations which led to the announcement last Tuesday by War Assets Administration that it is leasing the government-owned Republic No. 5 blast furnace and the nearby coke plant at Cleveland to Kaiser-Frazer Corp. The question which overshadows momentarily the rights of the principals in the transaction is whether or not the properties can be kept in uninterrupted production.

The worst that can happen is that Republic will be forced to remove its ore and other materials and that the properties will be idle until K-F can assemble new supplies, supervision and manpower. The best that can be envisioned is a deal between K-F and Republic for the latter to continue operations. Right now it looks like an unfortunate mess that should have been avoided. —p. 51

* * *

**MISSING A GOOD BET?:** A. W. Gregg, executive engineer, Whiting Corp., submits a timely revival of the question of why steel producers overlook the possibilities of the side-blow converter.

He points out that the quality of steel produced in a side-blow vessel is superior to that made by the standard bessemer converter and that side-blow operation produces steel at a higher temperature for a given composition of the charge. The initial cost of a side-blow installation is less than half of that of a standard bessemer of equivalent capacity. The fact that the blast pressure for side-blowing is low compared with that for bottom blowing results in substantial economies. Also, the converter is practically independent of scrap supply—a decided advantage under present conditions.

Perhaps belated recognition of the advantages of the side-blow converter will develop. A 11-ton vessel was operated experimentally by a large steel company and produced excellent steel. Another large steelmaker now is experimenting with a side-blow unit having a capacity of 22 tons. —p. 98

* * *

**GERMAN SCRAP IS MOVING:** It may be premature to say that at long last the obstacles which have retarded the shipment of important tonnages of scrap from Germany to the United States have been removed. However, it is safe to say that the outlook for early movement of this material in encouraging volume is brighter than at any time since V-E Day.

Western Steel Corp. of New York has announced purchase of 250,000 tons of scrap from the German National Railways for delivery to Bethlehem Steel Co. This follows reports from Europe and the United States of several other deals involving fair-sized tonnages for American interests.

Meanwhile, an intensified drive for the collection of domestic scrap in the United States is being planned. It will be launched at a meeting to be held in Washington late in September. —p. 50

* * *

**KEY TO PRODUCTIVITY:** Much that has been said about the importance of materials handling to the efficient operation of a manufacturing plant applies with equal force to the handling of work in intricate automatic machines. A case in point is the 13-station transfer type machine developed by Snyder Tool & Engineering Co. to machine manifolds for Kettering engines.

Each of the 13 stations really is a machine in itself. Obviously it is important that each be designed to perform its designated work efficiently. However, the factor which makes the giant, 89,000-pound assembly of individual units effective from an over-all production standpoint is the ingenious manner in which each manifold is transferred from station to station, positioned and clamped for each machining operation and released for subsequent work. This transferring, locating, clamping and releasing—done hydraulically—is the key to the machine's productive rate of one manifold every 48 seconds. —p. 74

E. L. Shaner

EDITOR-IN-CHIEF

# News Summary

**STEEL TRANSPORTATION—** Changeover to mill pricing of steel products will have no drastic effect (p.45) on the methods used to carry these products from mill to consumer. Rail shipments will continue to predominate. Truck and water shipments, although sometimes cheaper, will be limited by loading and handling facilities. These now are being used at close to present capacity; the mills used the most economical means of transportation while they were absorbing freight and it is not likely that consumers can immediately effect any considerable saving over what the mills paid. Truck shipments of all freight, however, are gaining and established a new record in the first half of 1948. Railroads will ask a new freight rate increase (p. 46) of 7 per cent to compensate for increased costs.

**K-F GETS DPC STACK—** Several hundred foundries which have been obtaining pig iron from Republic Steel Corp. are worried over their source of iron supply as result of the leasing (p. 51) of the U. S.-owned Cleveland blast furnace plant, operated by Republic since its construction in 1943, to the Kaiser-Frazer Corp. Republic says it will have to withdraw from the northern merchant iron market at the end of the month, and use all its available iron for steelmaking. The lease action has drawn vigorous protests from Republic, with whose facilities the government plant is scrambled, from founders, and from some congressmen. Republic charges the rental asked from Kaiser-Frazer is only about half that asked of Republic by the War Assets Administration.

**REPORT ON FUEL ECONOMY—** Automotive engineers meeting on the West Coast recently heard the first progress report (p. 59) on the General Motors high-compression engine being readied for forthcoming Olds and Cadillac models. Gains of up to 25 per cent were recorded with present gasoline with a 8 to 1 engine, while a 10 to 1 engine showed a saving of 40 to 45 per cent on 98-octane fuel.

**EXPORTS—** Is too much steel being shipped abroad? Many American consumers who find it difficult or impossible to procure adequate supplies believe exports are too large. Especially do they resent shipments of American steel products to countries which have substantial steel producing facilities of their own (p. 49). Exports for the first five months totaled 2,115,678 net tons.

**STAINLESS FACILITIES ENLARGED—** Republic Steel Corp. has expanded its facilities for producing stainless flat-rolled material (p. 57). New mills at Massillon, O., will produce stainless sheets up to about 60 inches in width.

**FOREIGN AID—** A master plan for assisting foreign nations to recover from the effects of the war is expected to be evolved soon by the Economic Co-operation Administration (p.52). Machine tool builders should have a good idea of ECA tool requirements by early 1949. Steel requirements under the program are expected to increase as Europe's capacity to utilize the material develops.

**SCRAP—** German scrap soon will be flowing to the United States (p. 50). One lot of 250,000 tons, purchased from the German National Railways, soon will be shipped to Baltimore for use by Bethlehem Steel. Several other purchases are reported in Germany, along with smaller tonnages bought in Belgium and Italy. Meanwhile, plans for a domestic scrap drive are being formulated in Washington.

**HERE AND THERE IN INDUSTRY—** General Electric has transferred its welding division to New England (p. 62) . . . Industrial activity booms along at near peak levels (p. 64) despite summer vacations and materials shortages . . . In England, shutdowns for vacations adversely affected steel production in July (p. 55) . . . Bizonal Germany (p.55) continues to be plagued by instability of prices, production, currency . . . Kaiser-Frazer auto sales in first half 1948 are up 118 per cent (p. 60) . . . West Coast steel users, still dependent on the East for a substantial portion of their supplies, are divided in their opinions as to the effect of the mill pricing system (p. 47) . . . . First meeting of the Capehart committee to study the effects of the pricing change on the economy (p. 46) will be held in Washington Sept. 15.

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STEEL
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# Steel Shipping Changes Limited

**Inadequate handling, loading, trucking and water transport facilities seen preventing wholesale diversion of tonnage from railroads as buyers seek lower freight costs**

DRASTIC changes in modes of steel transportation will not appear for a long time to come.

That's the opinion of steel producers since abandonment of freight absorption and adoption of mill pricing.

From their knowledge of the facilities available for shipping steel by rail, truck and water, they see a preponderance of the finished steel produced in this country continuing to be carried over tracks. While customers are taking longer looks at freight rates on all types of carriers than formerly, it does not necessarily follow lower rates for one form of transport will immediately mean a complete swing to that carrier.

**Chicago Provides Example** — The situation with respect to two Chicago area steel producers is indicative for comparably located mills. Truck, rail and water transport are available. Yet, with one company, the most tonnage that can be shipped from its plants by water and truck with present loading arrangements is estimated at about 15 per cent of its total movement.

Shipments from the other company's plants make quite a different pattern. From the first of the year rail shipments have amounted to close to 60 per cent of the total, trucks for something over 35 per cent and water for less than 5 per cent.

**Comparative Rates** — How rail, truck and water rates on finished steel shipments from Chicago to important consuming points over a wide compass sweep compare is shown by the following:

To Detroit, the all-rail rate per net ton is $8.80 with a minimum load of 20 tons; by truck (10-ton minimum load) the rate is $5.80; and by water, including a terminal expense at both ends of the haul of $2.75 per net ton, the rate is $5.20 on shipments of not less than 2500 net tons.

To Indianapolis, the rail rate is $6.20 from Gary and $7.20 from Chicago; truck shipments cost $5.20 per net ton.

To St. Louis, steel's train fare is $7.60, as compared with $7.20 by truck and $5.01 by boat. The water rate includes $3.42 terminal expense at both ends and is based on a minimum shipment of 500 net tons.

To St. Paul, rail costs $11.80, trucking with a minimum load of 15 tons costs $13.20, and a minimum boatload of 350 net tons costs $8.47 per ton, including the separate terminal expense at destination of $1.77.

To Des Moines, rail rate is $10.60 per ton, against a truck rate of $9.24.

**Mills Sought Cheap Freight**—The current situation boils down to this: Despite some freight rate advantages enjoyed by a particular type of carrier, there are definite limitations on the traffic that can be handled by that carrier. Mills, when they were absorbing freight in most cases used the cheapest form of transportation to the fullest extent. Therefore, there probably is not much a steel consumer can do to reduce his present transportation costs. Of course, there are instances where new routes will be tried and combinations of two or three types of transportation will be evolved.

**Carriers Increase Capacity**—Possible diversion of steel shipments from rail to other forms of transportation raises the question of the availability of carrying capacity. Two recent developments will help the water carriers. One is the construction program by the privately owned water carriers. This industry placed in operation in the first six months of this year 15 new diesel-powered tow boats and scheduled for delivery an additional 15 before the end of the year. Power for the movement of 240,000 gross tons of cargo over the inland waterways of the country is thus provided for this fall, and by 1949 capacity will be increased by an additional 500,000 tons. The other is the voluntary allocation determined upon for the country's barge manufacturers.

## Record Truck Freight Loading

FREIGHT transported by motor truck and trailer reached an all-time high in the first six months of this year, according to the American Trucking Associations Inc.

Index figures showed a half-year average of 222 compared with the previous peak of 199 for the corresponding period in 1947. Index figures

STRIP STEEL COILS AT CARNEGIE'S IRVIN WORKS DESTINED FOR CANMAKERS

are computed on the basis of average monthly tonnage for the 3-year period from 1938-1940 as representing 100.

Reports from 294 truckers in 41 states show a total of 2,834,255 tons of freight carried in June, which was a 5.3 per cent increase over the 2,691,062 tons carried in May, and 16.6 per cent over the 2,430,348 tons carried in June of last year. Major item increases were reported for petroleum and iron and steel products. In June 73,146 tons of iron and steel were hauled by truck compared with 81,015 tons in the like month of last year.

## To Seek Another Rate Boost

NATION'S railroads will ask the Interstate Commerce Commission to boost freight rates by at least another 7 per cent. The carriers are preparing a petition which will be filed by Oct. 1.

The increase aims at bringing an additional $611 million in revenue which the railroads say they need in order to operate with a 6 per cent return on their investment. The carriers were disappointed with the ICC's final disposition of their year-old freight rate case on July 27. In answer to their plea for an overall increase averaging 29.2 per cent, the railroads were granted boosts averaging 22.6 per cent.

The carriers figure their coal and steel costs have risen about 10 per cent since last December as a result of wage boosts to workers in these industries followed by price rises. Other costs have risen proportionately, and the railroads estimate that their total 1947 purchases of $1909 million will be increased by $190,900,000 in 1948. Added to this are pending wage demands from non-operating brotherhoods who are asking a 25 per cent hike. Each cent per hour wage increase adds $39 million annually to railroad operating costs.

Freight rates now in effect are 44 per cent higher than those of June 30, 1946. The ICC says this 44 per cent boost has added more than $2.5 billion to shippers' costs.

## Austin To Make Cars in Canada

AUSTIN Motors Ltd., British automobile manufacturer, has completed arrangements to purchase a plant in Hamilton, Ont., where cars will be produced for the Canadian market. Premier Drew of Ontario said the province's Planning Department assisted in negotiations. Austin will be the first British auto firm to make cars in Canada, according to the premier.

# Council To Study Prices

**Capehart committee names business, labor, farm leaders to look into basing point situation**

SPECIAL senate subcommittee studying the effects of recent Supreme Court decisions on the nation's economy, including the effect of the basing point decision in the cement industry, has appointed a 35-man advisory council of business, labor and farm leaders to help in developing the investigation.

Senator Homer Capehart (Rep., Ind.), chairman of the special subcommittee of the Interstate Commerce Committee, last week said the council would thresh out the effects and implications of the Supreme Court's basing point decision and at the conclusion of their meetings will report their findings to the Senate committee.

First meeting of the advisory group will be held in Washington Sept. 15. Senator Capehart has indicated the Senate committee will not hold hearings until after the November election.

## Uniform Prices Banned Again

FEDERAL trade Commission last week hammered another nail into the coffin of uniform pricing when it ordered 12 manufacturers of bottle caps and their trade association to discontinue policies which served to bring about uniformity as to design, appearance, prices and terms of sale.

The FTC order over-ruled its trial examiner who had recommended the charges be dismissed on the ground no conspiracy was proved. The companies affected produce about 85 per cent of all bottle caps sold.

**Freight Equalization Banned**—Among the practices prohibited by the order is a freight equalization plan, which, the commission charged, the cap makers used to obtain uniform delivered prices at any given destination. The FTC found that while all bottle caps are sold f.o.b. point of manufacture, the manufacturer making the sale either credited the purchaser or by some other means allowed him the difference between the actual freight rate and the freight rate from the plant closest to him.

Other price fixing agreements, charged by the commission, were held to have the effect of furthering the alleged price fixing conspiracy and restrain competition.

Defendant companies in the action were: Crown Cork & Seal Co., Baltimore, Arco Crown Cork & Cap Co. Inc., Penn Cork & Closures Inc. (formerly Carvin Bottle Cap Corp.), Consolidated Cork Corp., Ferdinand Gutmann & Co., and Mundet Cork Corp., all of Brooklyn, N. Y.; Armstrong Cork Co., Lancaster, Pa.; Bond Crown & Cork Co. (formerly Bond Mfg. Corp. Inc.), Wilmington, Del.; Hoosier Crown Corp., Crawfordsville, Ind.; W. H. Hutchinson & Son Inc., Chicago; Mitchell & Smith Inc., Detroit; and Western Crown Cork & Seal Corp. (formerly Western Stopper Co. Inc.), San Francisco.

The order is also directed against L. C. McAuliffe, E. J. Costa, Joseph C. Feagley and Benno Cohn, individually and as officers and directors of Crown Manufacturers Association.

## Kaiser Issues Price Schedule

KAISER Co. Inc. issued its new schedule of prices last week, effective as of Aug. 15. As previously announced (STEEL, Aug. 16. p. 66), the company advanced prices an average of about $30 a ton on products produced at its Fontana, Calif., mill.

Mill prices now are as follows: Hot-rolled bars, 5.30c per pound; alloy steel bars, 5.50c; hot-rolled sheets, 5.65c; hot-rolled strip, 5.90c; cold-rolled strip, 7.10c; carbon plates, 5.80c; and structural shapes, 5.75c.

Prices quoted by other West Coast producers on these products at producing plants are as follows: Hot-rolled bars, 4.05c, Pittsburg, Torrance, Calif., 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Seattle, Wash., Portland, Oreg.; hot-rolled alloy bars, 4.80c, Los Angeles; hot-rolled sheets, 3.95c, Pittsburg, Torrance, Calif.; hot-rolled strip, 4.00c, Pittsburg, Torrance, Calif., 4.25c, S. San Francisco, Los Angeles, Seattle; cold-rolled strip, 5.75c, Los Angeles; carbon plates, 4.80c, Seattle; and structural shapes, 3.85c, Torrance, Calif., 4.30c, Seattle, S. San Francisco, Los Angeles.

## Steel Payrolls Hit New Peak

WAGES and salaries paid by the iron and steel industry in the first six months of 1948 set a new all-time record for a half year. They totaled $1,054,059,000. This figure excludes wages and salaries of steel company employees engaged in activities other than iron and steelmaking.

That payroll went to an average of 627,300 workers per month, about 16,500 more per month than were employed in the first half of 1947.

The American Iron & Steel Institute, which compiled these figures, reported the total payroll for June was $179,483,000.

# Mill Pricing Effect Uncertain

**Opinion divided among California steel buyers as to effect of basing point elimination. West still dependent on East for substantial part of supply despite local capacity gains**

*LOS ANGELES*

UNCERTAINTY and hope are the two words best describing current thinking of steel buyers in Southern California. Behind the words are two schools of thought as to present and ultimate effects of discontinuance of multiple basing point pricing in favor of f.o.b. plant pricing.

The main reaction to date has been to boost prices substantially. Most sellers are now in process of tabulating new prices. Opinion at the warehouse level is important because the area is as yet a "middleman's steel market" rather than a producer's market.

**Dependent on East**—That opinion, in majority census, holds that the West cannot yet supply its demands and will for some time remain dependent upon the East. This is a fact. It also holds that under the new set-up in the main, eastern mills will ship to relatively nearby customers rather than to the Far West with freight added to f.o.b. prices. This is a surmise.

Another school of thought, fostered in high industrial places in Los Angeles at least, is that the West's steel production capacity is now of the order of 70 per cent of needs and going higher, with additional cold reduction capacity now in process of completion. This is fact, but at present is modified by another fact which is that production at Geneva, Utah, is to considerable extent going into Arabian oil pipe so that that potential west-serving capacity cannot be fully counted.

**Fabricators' Position**—What is the result of this condition? How much steel are fabricators actually getting? The answers generally are: "Not enough," and "We are uncertain when we will get enough."

At the same time, hope remains high.

J. E. Lewis, vice president and general manager of the California Cold Rolled Steel Corp., said:

"We have just added to our slitting department a new type rotary gang slitter to slit wide coils or sheets of carbon or alloy steel, copper, brass and aluminum.

"We are building additional annealing furnaces which will increase our carbon steel annealing capacity 75 per cent and will be in operation in 30 days.

"We already have far more rolling mill capacity than there is steel to roll, but we are adding new auxiliary equipment to our rolling mills for a more efficient operation.

"Since the war we have been able to obtain only enough steel for 35 per cent operation but we are hopeful this condition will be cleared up."

DESERT BRIDGE: Although the new 52-mile railroad Kaiser Co. Inc. built to reach its Eagle Mountain iron ore deposits in California goes across arid desert it was necessary to build this trestle and 17 others as precautions against flash floods. Costing $3,800,000, the railroad ties into the Southern Pacific main line, with the total haul from ore bed to Fontana steel mill amounting to 153 miles

## Kaiser Price Hike Protested

OPPOSITION to Henry J. Kaiser's recent steel price increase averaging $30 per ton on products produced at his Fontana, Calif., plant, has crystallized in the form of a protest to the Reconstruction Finance Corp. to which Mr. Kaiser is in $100 million debt.

In a telegram to the RFC, the Western States Council, a federation of western chambers of commerce, has asked a 90-day delay in the effective date of the Fontana price increase. The council asked the RFC to appeal to Mr. Kaiser to suspend the increase for this period pending further investigation. The council last year supported Mr. Kaiser's request to the RFC for an $85 million write-down of the federal government loan on the Fontana mill.

**Buyers Protest** — The telegram, signed by Kenneth T. Norris, chairman of the council, and James F. Bone, secretary, said:

"Kaiser has informed his customers that peremptory steel price increases averaging $30 a ton will be effective Aug. 15 and has given as sole reason that he must take advantage of the temporary seller's market in order to meet terms and conditions of RFC loans when competitive conditions return. We have been informed that the Fontana loan was so modified prior to the recent general $10 increase, that it was a good loan and could satisfactorily be serviced. The general $10 increase only bolsters this contention."

**Cites High Prices**—The telegram then pointed out that Kaiser's price on plates, f.o.b. Fontana, was already $86 a ton compared with $68 f.o.b. Geneva, Utah.

"If the latest Kaiser increase goes into effect the Fontana price on plates will be $116 a ton, or 70 per cent above Geneva. Therefore, we feel an additional average $30 increase to be wholly unreasonable and that Kaiser is using the RFC as an excuse for his action."

"If examination of the facts discloses that to maintain Kaiser loans as good loans this or any other amount of increase is necessary, then reasonableness would dictate sufficient notice to Kaiser customers to give them a chance to readjust their affairs," the telegram concluded.

## Commerce Forms New Unit

**Secretary Sawyer creates Committee on Requirements to advise him on supply programs**

SERVING as a patrol to detect any strain from foreign commitments in the dikes of the domestic economy is Secretary of Commerce Charles Sawyer's new Advisory Committee on Requirements, created to advise him on supply and requirements programs now under Commerce jurisdiction.

This committee supersedes and coordinates the work of several other inter-agency groups which have been involved in policy and program decisions in export controls, priority assistance for export, allocations and related controls on materials specified by Congress, voluntary agreements with industry on priorities and allocations and other matters involving determination of supply requirements.

**Supersedes Decontrol Groups**—The new committee abolishes and supersedes the Advisory and Review Committees on the Second Decontrol Act and brings under it three committees which previously operated independently. They are: Subcommittee on Priority Assistance for Exports; U. S. Coal Operating Committee which becomes the Coal Export Allocation Subcommittee; and the Ad Hoc Subcommittee of the Advisory Committee on the Second Decontrol Act which becomes the Procedure Subcommittee.

Assistant Secretary of Commerce will be committee chairman and other Commerce representatives will be the directors of the Office of International Trade, Office of Domestic Commerce and Office of Industry Co-operation. Other government departments and agencies represented on the committee are: State, Treasury, Agriculture, Interior and Labor Departments, National Military Establishment, Housing and Home Finance Agency, Economic Co-operation Administration and Office of Defense Transportation. Although not a member of the group, National Security Resources Board has been invited to designate an observer to attend all meetings.

**Standards for Guidance**—Secretary Sawyer said the committee would be guided by the following standards: Elimination of as many emergency wartime controls as possible; stabilization of United States economy and curbing of inflationary tendencies; promotion of equitable distribution of goods and facilities; prevention of maldistribution of goods and facilities which basically affect the cost of living or industrial production; and furtherance of national security by assuring adequate supplies of necessary materials and equipment.

GROUNDWORK: German women laborers help lay dump car tracks as work is rushed on the new Berlin airfield that will permit an increase in airlift tonnage. American men and equipment are needed for expansion of Tempelhof airdrome, so groundwork on the new field is being done by 1300 German workers, 75 per cent of them women. Part of tank destroyed in the battle for Berlin still lies in the field, right foreground. NEA photo

## Defense Contractors Get Steel

ELIMINATION of paragraph 8 of the proposed voluntary agreement to provide steel requirements for the Armed Forces was approved at a meeting of the Steel Products Advisory Committee to the Office of Industry Co-operation at its meeting Aug. 12. This paragraph required that steel products on hand or under arrangements for delivery must be used in filling military contracts, if suitable for that purpose, before allocations are made.

Widespread objection to this requirement by fabricators caused the matter to be taken up for review. Elimination of the paragraph is interpreted to mean that fabricators will be able to replace through allocation steel used on military contracts.

## Tankers Get Steel Allocation

STEEL Products Advisory Committee to the Office of Industry Co-operation last week approved proposed voluntary allocation of 40,000 tons of steel products monthly, from October, 1948, through February, 1949, for construction of tankers.

The committee also approved proposed allocation of 2000 tons monthly, October through February, for construction research facilities for the National Advisory Committee for Aeronautics. However, in connection with this allocation the committee suggested that a study be made to ascertain whether existing government facilities could not be utilized before going ahead with a construction program requiring allocation.

Action was postponed by the committee on proposed voluntary agreements providing for allocation of steel for the manufacture of steel baseboard radiation and steel doors and bucks. Status of proposed allocation agreements covering segments of the petroleum industry, residential housing, and other critical industries were also discussed by the committee.

## Agree on Insurance Program

AGREEMENT on details of an insurance program covering 116,000 hourly employees in 46 plants across the nation has been reached by Ford Motor Co., and UAW-CIO.

New program provides accident and sickness benefits of $18 to $36 weekly for 26 weeks with amount of weekly benefits varying directly with employees' hourly wage bracket. Benefit begins on the first day of an accident or hospitalization for illness and on eighth day for non-hospitalized illness. Death benefits of the approved plan equal approximately one year's pay.

## Steel Exports Too Large?

**Government investigator holds small consumers' needs could be met if exports were reduced**

HOW MUCH American steel should be allowed to move to foreign destinations? That's a question many planners in Washington are trying to find a satisfactory answer for at this time.

The complaints which arise over the present steel export quota system stem principally from domestic steel consumers who are not getting enough steel to support a desired level of operations. These interests look with bitterness at the export destinations and the tonnage figures and ask why it is that semifinished and finished steel should be shipped to countries which have substantial steel producing facilities of their own.

**Program Criticized** — Paul O. Peters, staff investigator for the House Small Business Committee, was one of those who testified at a Department of Commerce hearing this month and reiterated this complaint. Mr. Peters criticized the steel export program and contended that the needs of small manufacturers could be met if foreign shipments were reduced.

Exports last year, he said, were "conservatively estimated" at 6,538,656 tons. Of this total, he stressed, 286,560 tons went to Sweden which has a large producing capacity and historically is an exporting nation. Belgium received 61,796 tons and Great Britain 195,311 tons. He charged that much of this steel is now returning to the United States in the form of British-made automobiles and Belgian steel sheets. He avowed that government people "need a different outlook" and should "make it their first duty to take care of American manufacturers before sending steel to foreign countries."

The Commerce Department's attitude toward these and other criticisms is indicated in a letter to Rep. Walter C. Ploeser, chairman of the Small Business Committee, following Mr. Peters' disclosures.

In it, Charles Sawyer, Commerce secretary, explained in respect to Sweden that for the current year exports licensed for shipment in first quarter were 28,000 tons and 19,000 tons for second quarter. He added, further, that during 1947 imports of steel products from Sweden were 9000 tons, and that current imports are at a much higher rate.

**Difficulties Explained**—Mr. Sawyer told Representative Ploeser: "I share your concern for the small businessmen of the United States who are suffering from shortages of critical materials. I know, however, that you will agree with me that only the valor of ignorance would suggest as a solution to the problem that we completely eliminate exports to other countries. . . . The difficult task confronting this department is to choose the point at which exports will be restricted or eliminated."

Steel exports so far this year have been running below the levels of last year and from month to month have shown a declining trend, as has the overall trend of all exports. In the latest month—May—steel shipments aggregated 346,453 net tons to bring the five-month total to 2,115,678 net tons. Details of these shipments may be found in the accompanying table.

**Tinplate Quotas Set** — Sixty-four foreign countries are included in the quotas on tinplate set up by the Office of International Trade, Commerce Department, for fourth quarter. The overall quota is 113,000 net tons to be shipped when supported by certified export steel (CXS) priority ratings and accepted by American producers of tinplate.

In addition to this tonnage, 14,000 tons have been designated by OIT as an unrated quota, 7000 of which may be sent abroad to package foodstuffs for importation into the United States and 7000 tons which may be used for purposes authorized by Tin Conservation Order M-43.

The five countries for which the largest export quotas have been established are: Australia 11,500 tons; Netherlands 9800 tons; Brazil 9450 tons; Argentina 8700 tons; and South Africa 7100 tons.

## Pipe, Tube Shipments Jump

SHIPMENTS of steel pipe and tubes totaled 3,302,748 tons during the first half of 1948, an increase of 10.7 per cent over the record shipments in the first six months of 1947, according to the Committee on Steel Pipe Research of American Iron & Steel Institute. The committee indicated that if this rate continues, shipments will exceed 1947 totals for pipe and tubes which were 6,117,884 tons, highest in history.

## U.S. Iron and Steel Exports—Five Months 1948

(Net Tons)

| | First Quarter | May | Five Months—1948 |
|---|---|---|---|
| **Semi-Finished and Finished Products:** | | | |
| Ingots, blooms, billets, slabs, sheet bars | 88,199 | 19,849 | 123,337 |
| Wire rods | 14,693 | 3,132 | 21,243 |
| Skelp | 17,019 | 1,792 | 24,101 |
| Iron bars | 1,834 | 246 | 2,513 |
| Concrete reinforcement bars | 39,524 | 9,306 | 60,606 |
| Steel bars, cold finished | 16,555 | 2,314 | 21,716 |
| Other steel bars (excluding alloy) | 108,964 | 26,325 | 156,935 |
| Alloy steel bars | 23,769 | 5,243 | 33,524 |
| Welding rods, electric | 4,238 | 1,658 | 7,684 |
| Boiler plate | 9,213 | 2,911 | 18,141 |
| Other plates, not fab. | 102,884 | 23,796 | 160,999 |
| Plates, fab., punched or shaped | 4,953 | 2,859 | 10,020 |
| Iron sheets, black | 5,343 | 924 | 8,165 |
| Steel sheets, black | 126,882 | 35,254 | 194,253 |
| Galvanized sheets | 12,722 | 6,565 | 23,464 |
| Strip steel, cold rolled | 16,670 | 4,689 | 25,651 |
| Strip steel, hot rolled | 22,274 | 5,926 | 34,905 |
| Tin plate and tagger's tin | 169,177 | 50,600 | 281,945 |
| Terne plate (incl. long ternes) | 2,363 | 498 | 4,232 |
| Structural shapes, plain | 89,731 | 25,032 | 137,922 |
| Structural shapes, fab. | 45,846 | 18,968 | 78,229 |
| Frames and sashes | 826 | 295 | 1,364 |
| Sheet piling | 11,471 | 3,726 | 21,061 |
| Rails, 60 lb. per yard and over | 108,159 | 9,418 | 136,098 |
| Rails, less than 60 lb. per yard | 1,588 | 346 | 3,909 |
| Rails, relaying | 7,122 | 1,014 | 11,126 |
| Splice bars and tie plates | 25,590 | 4,638 | 32,556 |
| Frogs and switches | 2,342 | 381 | 3,224 |
| Railroad spikes | 3,219 | 705 | 5,160 |
| Railroad bolts, nuts, and washers | 2,289 | 545 | 3,946 |
| Car wheels, tires and axles | 11,476 | 2,678 | 16,351 |
| Seamless black pipe | 5,051 | 1,622 | 8,756 |
| Seamless casing and oil line pipe | 52,375 | 19,408 | 96,341 |
| Seamless boiler tubes | 10,861 | 3,263 | 17,313 |
| Welded black pipe | 17,978 | 5,159 | 27,522 |
| Welded galvanized pipe | 11,123 | 3,019 | 18,604 |
| Welded casing and oil line pipe | 59,362 | 9,776 | 87,025 |
| Welded boiler tubes | 459 | 213 | 752 |
| Other pipe and fittings | 19,861 | 5,771 | 31,394 |
| Plain wire | 20,527 | 7,780 | 33,848 |
| Galvanized wire | 15,341 | 2,829 | 22,594 |
| Barbed wire | 13,149 | 2,033 | 19,381 |
| Woven wire fencing | 3,758 | 336 | 5,147 |
| Woven wire screen cloth | 1,351 | 358 | 2,343 |
| Wire rope and strand | 3,824 | 1,035 | 5,734 |
| Wire nails | 4,837 | 1,704 | 8,375 |
| Other wire and manufactures | 12,858 | 3,262 | 19,854 |
| Horseshoe nails | 264 | 31 | 341 |
| Tacks | 1,067 | 352 | 1,778 |
| Other nails, incl. staples | 2,971 | 872 | 5,104 |
| Bolts, nuts, rivets and washers, except railroad | 15,501 | 4,578 | 26,411 |
| Forgings | 7,853 | 1,373 | 12,431 |
| Horseshoes | 125 | 46 | 250 |
| TOTAL | 1,377,431 | 346,453 | 2,115,678 |

Source: United States Department of Commerce.

# German Scrap Begins Moving Here

**Substantial tonnages reported under contract for early shipment to this country. Purchase of 250,000 tons for delivery at Baltimore confirmed. Domestic scrap drive pending**

IT BEGINS to look as though substantial tonnages of iron and steel scrap shortly will be moving to this country from Europe. At any rate reports in business and government circles last week pointed toward encouraging developments hinting of early opening of the dike which has been holding up shipments.

Last week Western Steel Corp., New York, announced purchase of 250,000 tons of scrap from the German National Railways. This tonnage has been sold by Western, in association with Great Lakes Carbon Corp., to Bethlehem Steel Co. and shipments are expected to begin shortly to Baltimore.

**Largest Postwar Tonnage**—This is the largest lot of scrap originating in Germany sold for remelting in the U. S. since the war's end.

About the same time Western Steel Corp. was announcing the German scrap purchase Commerce Secretary Sawyer stated at a press conference in Washington he had just received word to the effect some 120,000 tons of German scrap had been purchased by American businessmen, some at a price of $26 per ton and some at $29 per ton, fas north German ports.

**More Contracts Signed** — STEEL's correspondent in Germany last week reported contracts involving 1.2 million tons of German scrap have either been signed or will be signed in the near future, for shipment to Great Britain and the U.S. A 250,000-ton contract with American buyers was signed in mid-July followed by another for export to the U. S. of 200,000 tons, this at $30 per ton fas.

Contracts also are reported having been signed for 50,000 tons each from Italy and Belgium.

GERMAN SCRAP IS LOADED AT BREMERHAVEN FOR SHIPMENT TO UNITED STATES

**Scrap Drive Planned** — Meanwhile with domestic scrap supplies a continuing cause for concern, Washington officials are making plans for an intensified collection drive. To put pep in this forthcoming campaign the Department of Commerce is preparing to hold a monster meeting late in September to which executives of some 500 trade associations will be invited.

## Autos Lead in Steel Use

THE AUTOMOTIVE and construction industries continued the leading consumers of steel during March but rail transportation dropped a notch, changing places with the container industry.

Figures by the American Iron & Steel Institute show the top four consuming groups received the following amounts in March: Automotive, 904,499 tons; construction, including maintenance, 653,993 tons; containers, 516,102 tons; and rail transportation, 406,324 tons. During both January and February, rail transportation had been in third place and containers in fourth.

The automotive industry's receipts amounted to 15.1 per cent of the month's total mill shipments of 5,978,533 tons. In February its proportion was 15 per cent.

The automotive industry also was the largest consumer of alloy (other than stainless) and stainless steels in March.

## Continuous Casting of Steel

LONGTIME dream of inventors that steel might be made from the liquid phase to semifinished shape in one simple, relatively inexpensive machine has become a reality through joint development of Republic Steel Corp. and Babcock & Wilcox Tube Co.

Culminating six years' experimentation, the two companies have announced a method for continuous casting of semifinished steel which may have important possibilities for the entire steel industry. Leading advantage of the process is elimination of the need for massive and expensive equipment for ingots, soaking pits and blooming mill. Continuous casting permits passing directly from the melt to semifinished sections ready for secondary mills.

Continuous casting of nonferrous metals has been routine industrial practice for the past ten years. Steel offers greater difficulties in the way of higher metal temperature, erosion, segregation, slag inclusion and safety factors. The process developed by Babcock & Wilcox and Republic permits the casting of both carbon and alloy steel.

The process uses steel, copper or brass molds.

## Meetings . . .

**Aug. 24-27, American Institute of Electrical Engineers:** Pacific general meeting, Spokane, Wash. Institute headquarters are at 33 W. 39th St., New York.

**Aug. 30-Sept. 3, American Chemical Society:** Eastern section of annual meeting, Washington, D. C. Society headquarters are at 60 E. 42nd St., New York.

**Sept. 6-10, American Chemical Society:** Midwest section of annual meeting, St. Louis. Society headquarters are at 60 E. 42nd St., New York.

**Sept. 7-9, Society of Automotive Engineers:** National tractor and diesel engine meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

**Sept. 7-10, American Society of Mechanical Engineers:** Fall meeting on hydroelectric resources and wood industries of Pacific Northwest, at Portland, Oreg. Society headquarters are at 29 W. 39th St., New York.

**Sept. 9-10, American Ceramic Society:** Fall meeting, Hotel Conneaut, Conneaut Lake Park, Pa. Society headquarters are at 2525 N. High St., Columbus, O.

## Foundries Face Iron Loss

### Republic Steel loses DPC blast furnace to Kaiser-Frazer in WAA lease deal

SEVERAL hundred foundries, especially those located in northern Ohio and in the Niagara frontier, face possible loss of a major pig iron source as result of the leasing of the government-owned Cleveland blast furnace plant, operated by Republic Steel Corp. since 1943, to the Kaiser-Frazer Corp.

Loss of the stack's output, figured at 450,000 tons annually, may necessitate large-scale withdrawal by Republic from the northern merchant iron market. Iron produced at Buffalo and sold to foundries in that area will be hauled to Cleveland to help make up the steelmaking needs of Republic's Cleveland facilities.

Republic wired the Department of Commerce that it would not be able to fulfill its voluntary allocation quotas of 2245 tons of pig iron a month for the housing program and 3724 tons a month for the freight car program as result of the loss of the leased furnace.

**Lease Is Surprise**—Award of the blast furnace and coke plant to Kaiser-Frazer by the War Assets Administration on a temporary lease basis came as a surprise.

Several months earlier Preston Tucker, president of Tucker Corp., had made a spirited bid for the facilities, hoping to use pig iron from the plant to trade for steel to be used in the Tucker automobile. His bid was refused by the WAA.

Last week WAA disclosed the lease to Kaiser-Frazer. Terms call for payment of $1.50 a ton for pig iron produced and a similar amount per ton of coke produced. Lease can be cancelled by either party on 30 days' notice. It is to become effective Sept. 1.

Kaiser-Frazer is given the option of operating the plant under a 20-year lease, with minimum rental set at $800,000, or purchasing it outright for $14.2 million, less rentals paid.

**Republic Protests**—A vigorous protest was made to WAA Administrator Jesse Larson by Republic Steel, which pointed out that the rental asked of Kaiser-Frazer "is less than one-half of the $2,500,000 rental which you were demanding from us and is less than the rental we have heretofore offered, and now reoffer, to you for either long-term or interim lease."

Republic asked for a congressional review of the action and for full disclosure of the terms and circumstances of the transaction between WAA and Kaiser-Frazer.

Other protests against the agreement were made by the Gray Iron Founders' Society, by Preston Tucker, and by several congressmen.

Just how Kaiser-Frazer will utilize the output of the plant had not been announced late last week although it generally was expected the pig iron would be used to improve the company's barter position for other iron and steel products, reinforcing tonnage now coming from the Ironton, Utah, furnace.

The government-owned facilities are to some extent scrambled with the privately-owned facilities of Republic and some difficulty of operation by Kaiser-Frazer is anticipated. K-F last week asked for a conference with Republic officials, but results of the talks were not immediately available.

**Built in 1943** — The 1300-ton stack and battery of 75 coke ovens were built early in the war by the Defense Plant Corp. at a cost of $29 million. The blast furnace produced its first iron Oct. 29, 1943. From the first, the plant was operated by Republic and was designed as a part of that company's Cleveland facilities. The blast furnace was used in experiments for operation under predetermined top pressures.

**Raw Materials May Be Problem**—Obtaining of adequate supplies of iron ore and other raw materials may pose a considerable problem for Kaiser-Frazer. Iron ore supplies are tight and vessel space for transporting ore and limestone also are difficult to obtain.

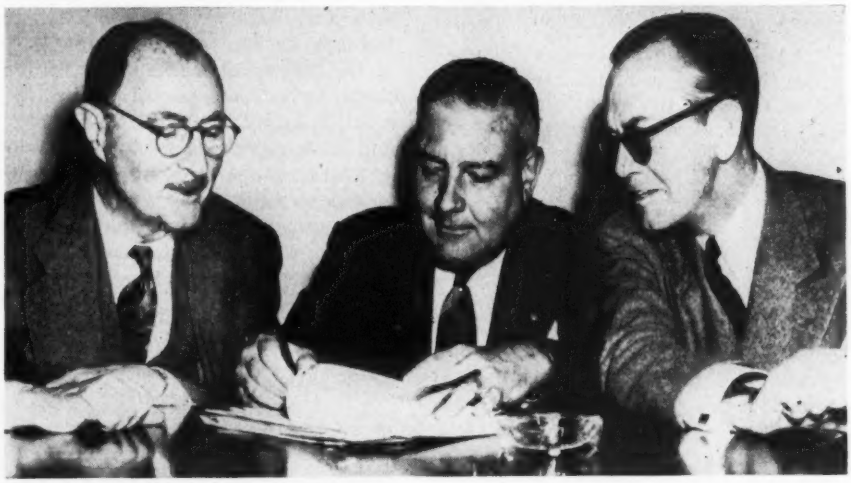
Republic in its telegram to WAA pointed out that it has the operating staff, iron ore, coal and other raw materials essential to continued operation of the plant.

## Fair Day's Work Requested

MORE than 7000 workmen at the Buffalo plant of Westinghouse Electric Corp. last week were urged by General Manager Leon R. Ludwig to do "a fair day's work because we are losing money."

The plant is turning out 20,000 units a month but Mr. Ludwig declared in a letter to employees "we are not getting more than two-thirds of the production we have the right to expect." He warned this cannot continue if the plant is to stay in business and provide jobs.

Placing the problem before the workers, Mr. Ludwig analyzed why a fair day's work was necessary, pointing out prices are set by competition and that Westinghouse has more than 30 aggressive competitors. Consequently, he said, Westinghouse's No. 1 requirement is to be able to match its competitors' selling prices.



*This signing of formal papers transferred a major part of the Wright Aeronautical Corp. plant at Lockland, O., from the War Assets Administration to the Electric Auto-Lite Co. of Toledo, O. Sale price of $8,400,000 does not include three foundry buildings being kept by the Air Force. Left to right are: D. H. Kelly, Auto-Lite's executive vice president; M. C. Goodman, deputy administrator in WAA's office of real property disposal; and Walter V. Flood, an Auto-Lite vice president.*
*NEA photo*

## NLRB Voids Lake Hiring Halls

UNION hiring halls maintained in Great Lakes ports by the CIO National Maritime Union are illegal, the National Labor Relations Board ruled last week in a decision which may have wide ramifications in other areas and industries.

# Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

**Definite program for Marshall Plan expenditure authorizations shaping up but Economic Co-operation Administration must solve problems before fully effecting long-range plans**

PAUL HOFFMAN'S Economic Co-operation Administration so far has been authorizing Marshall Plan expenditures on a sort of "spot" basis which has taken into consideration two main objectives.

The first is that the people of Western Europe have to be kept alive until a long-range economic program is perfected.

The second is that Congress provided for first-year disbursement of $4,055,000,000 in gifts plus loans coming to another $1 billion. The ECA procedure to date, therefore, has been one of just doing the best it can.

**Definite Program** — This condition promises very soon to be supplanted by a much more definite program; in fact, it was to bring about such a change that Paul Hoffman took his recent trip to Paris. He had two things mainly in mind. First, he wanted the annual programs for each participating country as seen at this time. Second, he wanted an overall Western European master program for the whole 4-year period to June 30, 1952.

On the basis of reports from Paris it begins to appear that the programs of the individual countries for the Marshall Plan's operation in fiscal 1950 will be received in Washington before the end of December. After that the ECA will screen all these programs and soon thereafter should be in a position to inform American industry as to the extent to which it can expect to get future business under the Marshall Plan.

**Machine Tools** — In particular, manufacturers of machine tools and other capital goods should have a fair idea some time in the first quarter of 1949 as to the amount of business they can expect to book in connection with the building up of Europe's postwar economy.

In the meantime, ECA has some problems to work out before the long-range program can be put in smooth operation—and they are difficult problems. One is the working out of an exchange arrangement acceptable to all parties involved; this is a tough one. Another difficult one is that of encouraging trade between eastern and western Europe without building up the military potential behind the Iron Curtain. Another is that of getting increased man-hour productivity in the participating countries.

This latter problem already has been tackled in a preliminary way by Great Britain and France; in those countries there is no appreciable amount of unemployment so that the only way to increase production is through an increase in productivity of the individual worker. In Britain steps have been taken toward the creation on a Council of Productivity, and ECA expects to tender full United States co-operation by inviting the British to come over here to see what lessons they can learn from our practice. In Great Britain some of the important industries have man-hour productivity ranging from 20 to 50 per cent of that in the same industries in the United States. The same is generally true of productivity in France, where steps are in motion to establish a Commission on Productivity.

MAURICE J. TOBIN

*As the new secretary of labor he fills a cabinet post vacant since June 10 when its holder, Lewis Schwellenbach, died. The 47-year-old Mr. Tobin, former mayor of Boston and former governor of Massachusetts, quit the race for Democratic nomination for governor to take the cabinet post, but only after some serious thinking. In the gubernatorial race he might have had to face the Republican who beat him badly in 1946. On the other hand a change in national administrations would knock him out of the labor post. NEA photo*

**Cash Authorizations** — In the meantime, cash authorizations so far approved by the ECA are furnishing a fair amount of business to American manufacturers—although the present volume is much smaller than that expected for ensuing years of the program.

From Apr. 9, when Paul Hoffman was sworn in as administrator, through Aug. 11 its authorizations for industrial equipment amounted to $22,100,000, while agricultural equipment came to an additional $1,400,000 Substantially all of the equipment involved will be produced in the United States. While the volume in 1949-1950 and succeeding years is due to be considerably larger, the extent to which the buying will be done in the United States and in the European countries themselves remains to be determined. Of course, one of the aims of the Marshall Plan is to get the participating countries into a state of balanced economy in which they can supply most of their own and each others' requirements, including capital equipment.

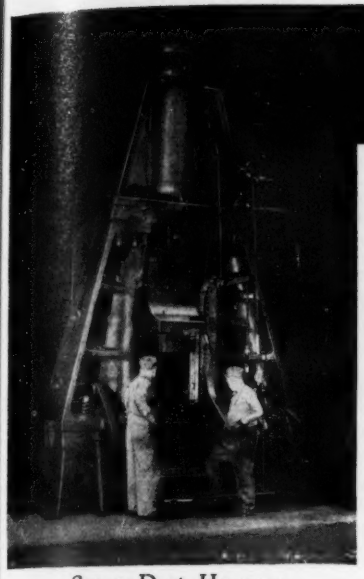
**Steel Authorizations** — Again, steel authorizations are not as large as they are bound to become as European ability to consume steel increases. For the period April 9 to the end of July they aggregated $18,500,000. Unfortunately the steel thus authorized is not easily broken down into tons, but at approximately $100 a ton something in the neighborhood of 185,000 tons is called for. This is in line with ECA's original intention to keep steel exports from the United States to Europe down. Later on, it is expected, the growing European steel demand will be satisfied more largely by shipments from Germany and Belgium—that is, after present plans to increase German steel production have been carried out. Of the approximately 185,000 tons referred to above, a portion is to come from Belgium, although the lion's share will be shipped from the United States.

Incidentally, to give a rough idea of just where our present aid is going, here is a breakdown of the beneficiaries from the authorizations for $18,500,000 worth of steel: United Kingdom $3,300,000; France $6,700,-

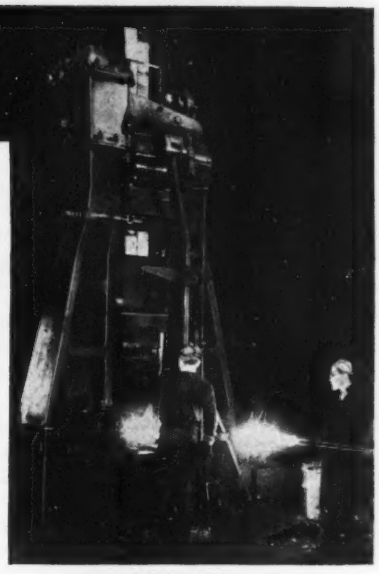
# CHAMBERSBURG

*Builders of* **IMPACT** *Machinery*

**CHAMBERSBURG HAMMERS are playing a significantly vital part in industrial production the world over . . . forming metal parts by impact . . . the one certain method of imparting extra strength and toughness to metal with a reduction in weight.**

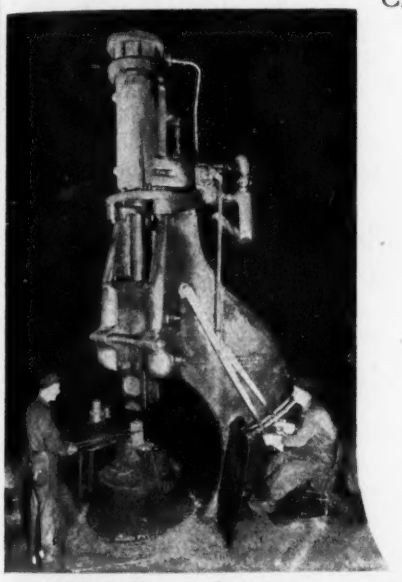


*Steam Drop Hammer*



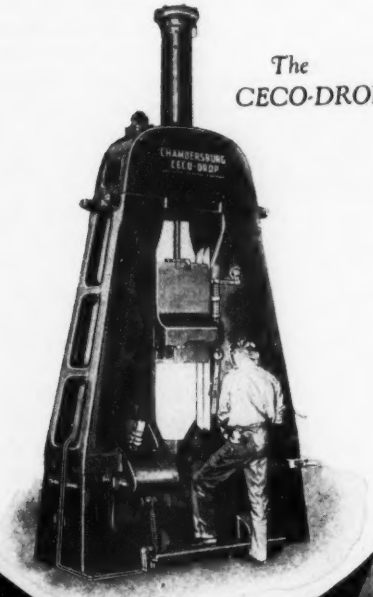
*Board Drop Hammer*

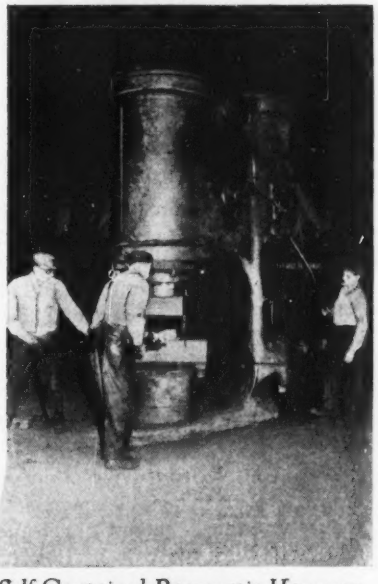
CHAMBERSBURG ENGINEERING CO.
Chambersburg, Pennsylvania, U. S. A.



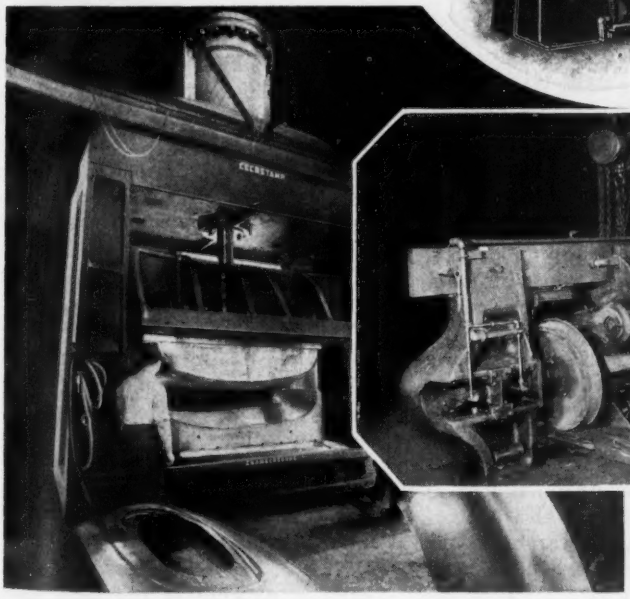
*Single Frame Hammer*

*The CECO-DROP*

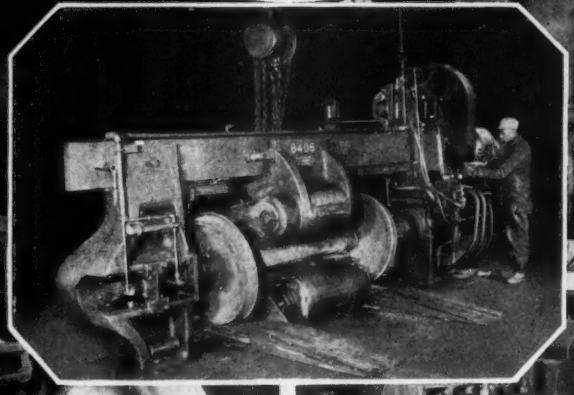




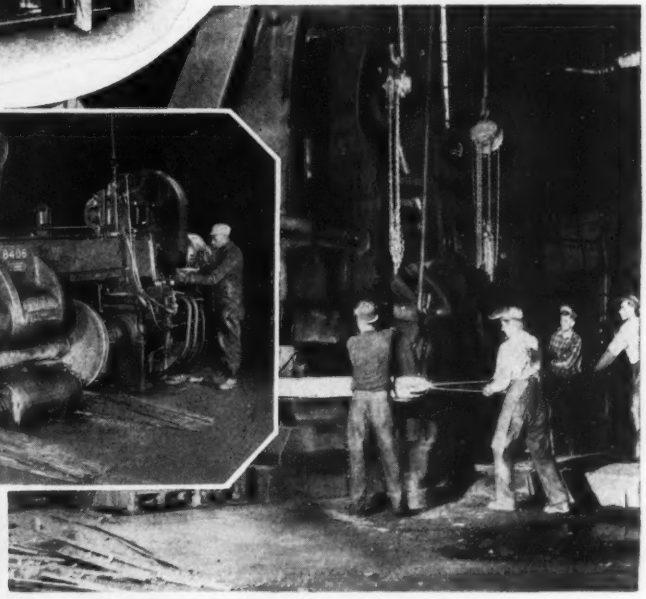
*Self-Contained Pneumatic Hammer*



*Cecostamp*



*Railway Car Wheel Press*



*Double Frame Forging Hammer*

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Included is the power to set up control of inventories of natural and synthetic rubber, control of the ratio of natural to synthetic rubber in manufactured products. Also authorized is continuous research in the field of synthetic rubber.

**Maintain Facilities** — The act provides that there shall be maintained at all times within the United States rubber producing facilities having a rated production capacity of not less than 600,000 long tons annually of general-purpose synthetic rubber and not less than 65,000 long tons of special-purpose synthetic rubber. Of the latter category at least 45,000 long tons shall be of a type suitable for pneumatic inner tubes.

These facilities eventually are to be disposed of to private parties to create a "sound" industry, and the act looks forward to eventual complete withdrawal of all present controls, such as patent pooling, inventory controls and mandatory use of synthetic rubber.

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Until Congress again acts, no more government-owned rubber plants can be declared surplus and sold.

## Prefabricators Get Big Lift

A BIG lift should be given to prefabricated house production as a result of two provisions of the housing act signed by President Truman on Aug. 10.

One authorizes the Reconstruction Finance Corp. to make investment capital loans to prefabricators to enable them to acquire plants and equipment; the RFC can make or guarantee loans up to 75 per cent of the cost of plants and equipment.

The other authorizes the Federal Housing Administration to make or guarantee operating capital loans to prefabricators up to 90 per cent of the estimated cost of the housing units to be produced. The prefabricators can repay the loans 30 days after delivery of the houses to dealers, or they can tender a 180-day promissory note. The dealers can obtain similar assistance to enable them to pay the prefabricators for the houses upon delivery.

This latter provision previously had been applicable to prefabricators, but the prefabricators could get the operating capital loans only after they had found a firm buyer for the houses to be produced. Because of this requirement, only one such loan had been arranged, that to Housemart Inc., Cleveland.

With easing of the law to permit loans in advance of the sale of the houses, more prefabricators are expected to apply for loans.

RUSSIAN EXHIBIT: When the German Economic Commissions of the east and west sectors of Berlin held an exhibition of trade and commerce recently, the Russians, who have no auto manufacturing plant in their sector, used this display of a reconditioned car and a "junker" to boost their car reconditioning plant. NEA photo

## Bizone Lacks Stability

**Currency reform aids consumers but handicaps makers of capital goods. Inflation feared**

WESTERN Germany's economy continues in a state of flux, no stable level of prices, production or sales having yet developed since the currency reform.

The new money was placed primarily in the hands of consumers and thus created a tremendously effective demand for consumers goods and skyrocketed their prices.

On the other hand, the whole capital goods industry operates under the reform with insufficient money to pay its wages. When the reform was planned and executed, too little attention apparently was given to the problems of these firms, and the money was distributed in too one-sided a manner—the vast bulk of it going directly to individuals rather than to business organizations.

The inflationary effect of this distribution, furthermore, has been heightened by retroactive payment of wages and salaries in June and by the high occupation costs. It may be expected, however, that rising prices will effectively check some of the current consumers goods demand and the emphasis will shift from consumers to capital goods in the coming months.

**Investment Plans**—A group of German, American and European industrialists have prepared plans for construction of large power plants in the Ruhr, to use inferior grades of coal to produce electricity which would be distributed on a trans-European scale, the power to be exported rather than the coal, as at present. Another plan is for construction of a large steel plant in Germany, to be operated by non-German interests under long-term lease.

**Nationalized Coal**—The parliament of North Rhine-Westphalia early this month passed a law socializing the majority of the Ruhr's coal mines. The measure, however, is symbolic only, since the mines are under Allied custodianship at present and no disposal of assets is possible. Furthermore, the move is of such importance that it will have to be acted upon later when a national parliament for all of Western Germany is set up.

**Steel Production Up**—July saw steel production reach a postwar monthly record at 457,623 metric tons, or 21 per cent over June production. This augurs well for steel production over the next 12 months of six million tons. The Ruhr steel plan for the next four quarters aims at 1.2 million tons in first quarter, 1.4 million in second, 1.6 in third and 1.8 in the quarter ending next June.

## Vacations Drop British Output

*BIRMINGHAM, ENG.*

VACATION closings were reflected in the drop in Britain's iron and steel production rates in July, the British Iron & Steel Federation placing steel production on an annual basis at 12,084,000 tons, from a second quarter average annual production of 15,323,000 tons and a July, 1947, annual rate of 11,008,000 tons.

Pig iron output in July was 8,908,000 tons on an annual basis, compared with 9,464,000 tons (annual basis) for the second quarter. Iron output in July, 1947, on an annual basis was 7,460,000 tons.

The vacations will continue to have an unsettling effect upon business generally throughout August.

On the Northeast coast, production of pig iron has been increased by about 1000 tons a week by the start of another furnace at Normanby ironworks of Pease & Partners. There are now 26 furnaces operating in this section and 103 throughout the United Kingdom. Foundry iron continues in short supply, but coke and iron ore are now obtainable with little difficulty.

**Steel Imports Drop**—Semifinished steel imports for the first six months, at 57,633 tons, were about half of the total imported in the corresponding 1947 period. Steel ingot imports, at 14,133 tons during that period, also were far below tonnage received in the like 1947 period when 76,588 tons were imported.

The situation with pig iron imports, however, is vastly different. Britain's imports in the first half were 20,747 tons, compared with only 1850 tons in the like 1947 period.

Total iron and steel imports for the first half were 219,401 tons, compared with 288,917 tons in the like 1947 period.

Exports of iron and steel during the first six months showed a slight increase over the comparable 1947 period, half-year 1948 tonnage being 937,658 compared to 919,826 in 1947. Britain is exporting on a fairly large scale to Eire, West and South Africa, India, New Zealand and other colonies, and has sent substantial tonnages to nearby countries on the European continent.

**Finished Product Exports Important**—Overwhelming demands for steel in Britain have meant that the full amount of material required could not be spared for overseas, but since it is considered more expedient to ship goods in manufactured form rather than as primary materials, this phase of exporting has been concentrated upon. In the fall of 1947, for example, export volume was 114 per cent of the 1938 level. By mid-1948, 138 per cent of the 1938 rate had been achieved and by the end of this year it is hoped that export volume will reach 150 per cent of the 1938 level.

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## Prefabricators Get Big Lift

A BIG lift should be given to prefabricated house production as a result of two provisions of the housing act signed by President Truman on Aug. 10.

One authorizes the Reconstruction Finance Corp. to make investment capital loans to prefabricators to enable them to acquire plants and equipment; the RFC can make or guarantee loans up to 75 per cent of the cost of plants and equipment.

The other authorizes the Federal Housing Administration to make or guarantee operating capital loans to prefabricators up to 90 per cent of the estimated cost of the housing units to be produced. The prefabricators can repay the loans 30 days after delivery of the houses to dealers, or they can tender a 180-day promissory note. The dealers can obtain similar assistance to enable them to pay the prefabricators for the houses upon delivery.

This latter provision previously had been applicable to prefabricators, but the prefabricators could get the operating capital loans only after they had found a firm buyer for the houses to be produced. Because of this requirement, only one such loan had been arranged, that to Housemart Inc., Cleveland.

With easing of the law to permit loans in advance of the sale of the houses, more prefabricators are expected to apply for loans.

RUSSIAN EXHIBIT: When the German Economic Commissions of the east and west sectors of Berlin held an exhibition of trade and commerce recently, the Russians, who have no auto manufacturing plant in their sector, used this display of a reconditioned car and a "junker" to boost their car reconditioning plant. NEA photo

## Bizone Lacks Stability

**Currency reform aids consumers but handicaps makers of capital goods. Inflation feared**

WESTERN Germany's economy continues in a state of flux, no stable level of prices, production or sales having yet developed since the currency reform.

The new money was placed primarily in the hands of consumers and thus created a tremendously effective demand for consumers goods and skyrocketed their prices.

On the other hand, the whole capital goods industry operates under the reform with insufficient money to pay its wages. When the reform was planned and executed, too little attention apparently was given to the problems of these firms, and the money was distributed in too one-sided a manner—the vast bulk of it going directly to individuals rather than to business organizations.

The inflationary effect of this distribution, furthermore, has been heightened by retroactive payment of wages and salaries in June and by the high occupation costs. It may be expected, however, that rising prices will effectively check some of the current consumers goods demand and the emphasis will shift from consumers to capital goods in the coming months.

**Investment Plans**—A group of German, American and European industrialists have prepared plans for construction of large power plants in the Ruhr, to use inferior grades of coal to produce electricity which would be distributed on a trans-European scale, the power to be exported rather than the coal, as at present. Another plan is for construction of a large steel plant in Germany, to be operated by non-German interests under long-term lease.

**Nationalized Coal**—The parliament of North Rhine-Westphalia early this month passed a law socializing the majority of the Ruhr's coal mines. The measure, however, is symbolic only, since the mines are under Allied custodianship at present and no disposal of assets is possible. Furthermore, the move is of such importance that it will have to be acted upon later when a national parliament for all of Western Germany is set up.

**Steel Production Up**—July saw steel production reach a postwar monthly record at 457,623 metric tons, or 21 per cent over June production. This augurs well for steel production over the next 12 months of six million tons. The Ruhr steel plan for the next four quarters aims at 1.2 million tons in first quarter, 1.4 million in second, 1.6 in third and 1.8 in the quarter ending next June.

## Vacations Drop British Output

*BIRMINGHAM, ENG.*

VACATION closings were reflected in the drop in Britain's iron and steel production rates in July, the British Iron & Steel Federation placing steel production on an annual basis at 12,084,000 tons, from a second quarter average annual production of 15,323,000 tons and a July, 1947, annual rate of 11,008,000 tons.

Pig iron output in July was 8,908,000 tons on an annual basis, compared with 9,464,000 tons (annual basis) for the second quarter. Iron output in July, 1947, on an annual basis was 7,460,000 tons.

The vacations will continue to have an unsettling effect upon business generally throughout August.

On the Northeast coast, production of pig iron has been increased by about 1000 tons a week by the start of another furnace at Normanby ironworks of Pease & Partners. There are now 26 furnaces operating in this section and 103 throughout the United Kingdom. Foundry iron continues in short supply, but coke and iron ore are now obtainable with little difficulty.

**Steel Imports Drop**—Semifinished steel imports for the first six months, at 57,633 tons, were about half of the total imported in the corresponding 1947 period. Steel ingot imports, at 14,133 tons during that period, also were far below tonnage received in the like 1947 period when 76,588 tons were imported.

The situation with pig iron imports, however, is vastly different. Britain's imports in the first half were 20,747 tons, compared with only 1850 tons in the like 1947 period.

Total iron and steel imports for the first half were 219,401 tons, compared with 288,917 tons in the like 1947 period.

Exports of iron and steel during the first six months showed a slight increase over the comparable 1947 period, half-year 1948 tonnage being 937,658 compared to 919,826 in 1947. Britain is exporting on a fairly large scale to Eire, West and South Africa, India, New Zealand and other colonies, and has sent substantial tonnages to nearby countries on the European continent.

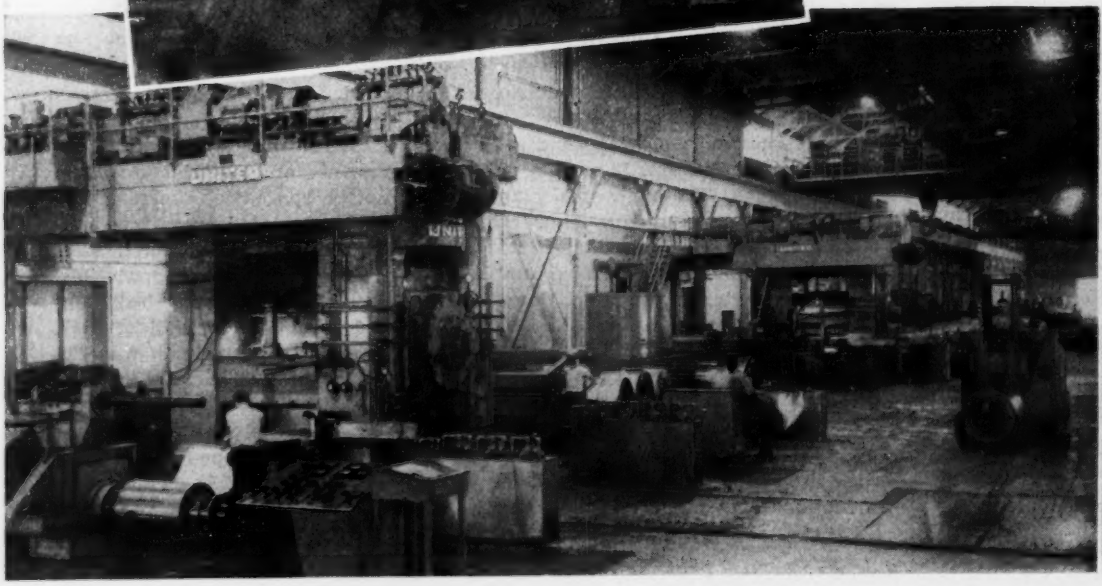
**Finished Product Exports Important**—Overwhelming demands for steel in Britain have meant that the full amount of material required could not be spared for overseas, but since it is considered more expedient to ship goods in manufactured form rather than as primary materials, this phase of exporting has been concentrated upon. In the fall of 1947, for example, export volume was 114 per cent of the 1938 level. By mid-1948, 138 per cent of the 1938 rate had been achieved and by the end of this year it is hoped that export volume will reach 150 per cent of the 1938 level.

The buildings, above, at Massillon, O., were extensively remodeled to house Republic's new stainless steel cold reducing and finishing facilities . . .

. . . Known as Enduro Plant No. 2, the new unit supplements equipment, including annealing furnace, at left, in nearby Enduro Plant No. 1 . . .

. . . The new plant's two cold reducing mills, lower left, permit rolling of stainless in greater widths than heretofore . . .





# Republic Expands Stainless Steel Facilities

**Revamping of buildings and installation of new equipment at Massillon, O., provide additional finishing unit and permit production of sheets up to about 60 in. in width**

REPUBLIC Steel Corp. sees a bright and shiny future for stainless steel. Accordingly, it has added to its facilities for producing that product.

Located at Massillon, O., the addition, now in operation, is known as Enduro Plant No. 2, which supplements Enduro Plant No. 1 there and substantially increases the company's capacity to produce stainless steel sheets.

Whereas stainless steel is flat-rolled to sheets with widths up to 30 inches at plant No. 1, sheets nearly twice this width will be rolled in plant No. 2.

The new equipment of plant No. 2 to cold reduce, anneal, pickle and finish stainless was set up in existing buildings at Republic's Massillon steel plant, but only after these structures were extensively remodeled, roofs raised, new crane runways installed and many improvements made in lighting, heating and ventilating. The remodeled buildings formerly were part of the old Massillon Rolling Mill and during the recent war housed equipment for armor plate fabrication.

Major items of equipment installed in the expansion are: Four breakdown anneal and pickle lines; five intermediate and finish anneal and pickle lines; three 4-high mills consisting of a 66-in. reversing breakdown mill, a 54-in. reversing cold reducing and finish mill, and a 66-in. temper or skin pass mill; four slitters; two cut up lines; two inspection benches; and one roll grinder.

**Other Plants Help** — Not all operations in stainless steel production are undertaken, however, at the Massillon plant. The steel is melted and refined in electric furnaces, cast into ingots and rolled into slabs in Republic's Canton, O., plant. The slabs are shipped to Warren, O., or Cleveland where they are rolled into heavy gage coils on the Warren 42-in. or the Cleveland 98-in. continuous hot strip mills. The hot-rolled stainless steel coils are then sent to Massillon either by truck or rail from Cleveland and Warren to become the raw material for the Enduro plants.

At Enduro Plant No. 2, the hot-rolled coils are passed through one of the breakdown anneal and pickle lines before any cold reduction is performed. This is to soften the steel for cold reduction and insure its cleanliness.

To cold reduce stainless steel from hot-rolled coils ranging up to 0.300 in. in thickness down to the finished gages, some as thin as 0.015 in., may require as many as three reductions of an average of seven passes each through the mills. Since each pass increases the hardness of the steel it is necessary to anneal and pickle the steel after each reduction. After the final, or finish, annealing and pickling the steel is passed through the rolls of the skin pass mill. The relatively slight pressure of this mill makes no further reduction in thickness of the steel but imparts to it a smooth, dense surface as well as physical characteristics to suit its ultimate use. The steel is then cut to the desired sheet sizes, and if higher luster or mirror finish is desired the sheets are sent to the grinding and polishing department of Enduro Plant No. 1.

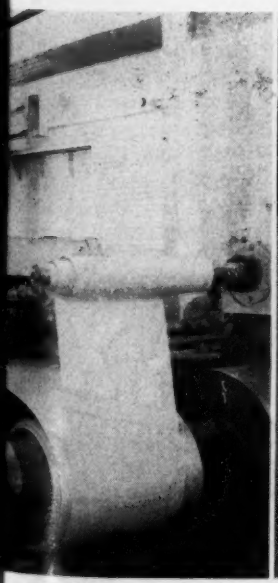
The 66-in. cold reducing mill rolls coils up to 60 in. in width and will make reductions from a maximum gage of 0.300 to a minimum of 0.015 in. Equipment on the 54-in. mill is identical with that on the larger mill except for the width of the rolls and minor differences accounted for by the lesser weight of coils rolled on this mill.

The 66-in. skin pass mill was moved from another Republic plant.

For slitting heavy gage material, two machines have been installed, a 36-in. heavy gage slitter and a 48-in. side trimmer. For lighter gages, there are a 48-in. finish slitter and a 60-in. side trimmer.

The cut up lines consist of two machines, a 48-in. and a 60-in.

. . . To protect its finish between various operations, stainless is interwound with paper, being gathered, lower center, before coil is further reduced . . .



. . . After annealing and pickling at new plant, hot-rolled rough finished stainless coils under 30 in. ride huge trailers to Enduro Plant 1 for further processing

# SEE HOW "THE NEW ARITHMETIC IN STEEL"* MAKES EVERY FOURTH PART A BONUS PART

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By A. H. ALLEN *Detroit Editor, STEEL*

# Mirrors of Motordom

## Automotive engineers told important gains in fuel economy demonstrated in test runs of General Motors new high-compression engine

*DETROIT*

FIRST progress report on the General Motors high-compression engine, scheduled to appear in Oldsmobile and Cadillac models shortly, was presented to the Society of Automotive Engineers last Wednesday at its national West Coast meeting in San Francisco by three engineers with the GM Research Laboratories Division—J. M. Campbell, D. F. Caris and Dr. L. L. Withrow.

Among the developments revealed in their highly technical discussion was the construction by GM of several test engines, with compression ratios of 7.5, 8, 10 and 12 to 1, all showing important gains in fuel economy.

The 10.1 compression engine, operating on a fuel of about 98 research octane number, was 40-45 per cent more economical in fuel consumption than the corresponding 1947 production engine which required a fuel of about 85 research octane. Two other engines, with 8.1 compression ratio (possibly the type now going into production at Cadillac and Olds), were described as "completely new designs," selected because they could be operated with some of the better premium grades of gasoline which have been sold commercially since the war. With such fuels, gains in economy as high as 25 per cent were observed.

**Improvements Shown** — Improvements in fuel economy of 10-25 per cent were shown to be possible at octane levels not much above those established by some present premium gasolines, and still further gains at higher octane ratings. The tests have been checked and rechecked in several engines and in different makes of cars under a wide range of driving conditions. No sacrifices in "performance" factors, such as smoothness, acceleration, hill-climbing ability, etc., were required.

The petroleum industry now has manufacturing capacity to produce about 20 per cent of its total volume of gasoline in the 96-98 research octane range, sufficient to supply fuel for several years' production of engines requiring this grade. To produce still greater quantities would require substantial capital equipment readjustments within the oil industry, and for this reason, one petroleum engineer has proposed studies of a dual-fuel system in which the carburetor would be supplied with both high and low-octane gasoline, the former to be admitted only during the time the throttle was open wide enough to require this type of fuel. This would greatly extend the effectiveness of a given limited quantity of high-octane gasoline.

**Another Proposal**—Another proposal, advanced at the SAE summer meeting this year, covers the injection of an antidetonant mixture of methyl alcohol, water and tetraethyl lead, carried in an auxiliary fuel tank under the hood of the car and fed by gravity to a vacuum-controlled jet admitting the mixture at throttle settings requiring a high-octane fuel. Practicability and public acceptance of such dual-fuel ideas, as the GM engineers point out, is a matter for conjecture, but in any case the large-scale production of high-compression engines eventually will require the national distribution of high-octane fuel, which is not only a challenge but an opportunity for the continued progressive development of fuels and engines such as has occurred over the past 20 years.

For example, back in 1930 the fuel economy of the average of domestic cars of all makes was about 28 ton-miles per gallon. This has now gone up to 38 ton-miles per gallon, better than 30 per cent increase. Half of the gain has been realized by the hand-in-hand march of compression ratios and octane numbers of gasoline. Compression ratios have increased from about 5.1 in 1930 to an average of 6.7 in 1947. Premium motor fuels have gone from 70 octane in 1930 to the current value of 80 or better.

**Engineering Progress**—The rest of the fuel economy progress has come from engineering improvements in engines, headed by the control of air-fuel ratios at different speeds, particularly between 10 and 30 mph. Vacuum spark control is of course what makes it possible for the carburetor engineer to lean out his air-fuel ratios for road-load operation. Another factor is residual gas concentration in cylinders, and this is lessened as compression ratios go up. In the opinion of the three GM researchers, much still remains to be done in leaning out further the air-fuel mixtures, especially in the low-speed range under partload conditions.

A particularly interesting disclosure with respect to the high-compression engines is that the octane requirements of the engine are substantially lower with the torque-converter type of transmission than with the step-type of hydra-matic drive, for the reason that the torque converter does not allow the engine to operate continuously at full throttle at speeds lower than 1600 rpm. With the torque converter it was possible to operate a test car engine with 12.1 compression ratio on 92 research octane gasoline, while with the hydra-matic drive the car could not be operated satisfactorily on this fuel because of severe low-speed knock.

**Speculate on Transmission**—Oldsmobile and Cadillac, of course, feature the hydra-matic transmission, while Buick's new system is the

### Automobile Production

**Passenger Cars and Trucks—U. S. and Canada**

| | 1948 | 1947 |
|---|---|---|
| January | 422,324 | 366,205 |
| February | 399,460 | 393,636 |
| March | 519,133 | 443,588 |
| April | 462,315 | 445,137 |
| May | 359,989 | 404,191 |
| June | 454,388 | 421,466 |
| 6 mos. | 2,617,609 | 2,474,223 |
| July | 487,766 | 399,456 |
| August | | 364,478 |
| September | | 444,501 |
| October | | 461,536 |
| November | | 417,493 |
| December | | 492,109 |
| 12 mos. | | 5,055,284 |

**Estimates for week ended:**

| | 1948 | 1947 |
|---|---|---|
| July 24 | 118,797 | 83,867 |
| July 31 | 113,706 | 97,712 |
| Aug. 7 | 108,864 | 79,452 |
| Aug. 14 | 112,102 | 83,501 |
| Aug. 21 | 105,000 | 84,726 |

*Estimates by Ward's Automotive Reports.*

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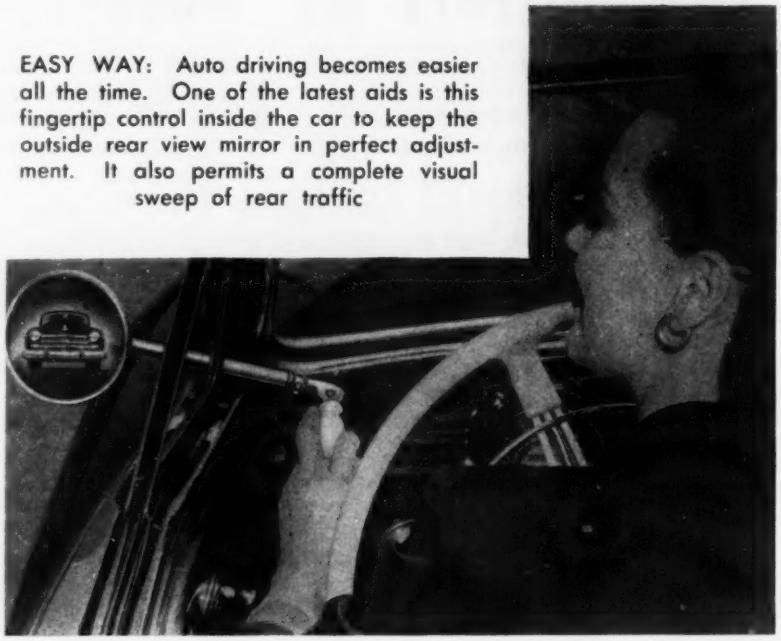


EASY WAY: Auto driving becomes easier all the time. One of the latest aids is this fingertip control inside the car to keep the outside rear view mirror in perfect adjustment. It also permits a complete visual sweep of rear traffic

torque-converter type. This naturally leads to speculation over whether the first two eventually may change to the torque-converter type. Reportedly it is less costly to manufacture in quantity because of considerably fewer piece parts. However, major changes in equipment and tooling would be needed by the Detroit Transmission Division of General Motors, which builds the hydra-matic for Olds, Cadillac and Pontiac.

The Transmission Division currently is turning out these units at a rate of 2000 per day, still not enough to encompass demand. A new 250,000 sq ft feeder plant is being built just west of Detroit's city limits, in the effort to step up capacity. Plenty of room exists there for expansion. In view of research findings it could well be that Detroit transmission eventually will discontinue the hydra-matic and launch the manufacture of torque-converter transmissions patterning the Buick design. Chevrolet engineers are testing a torque-converter transmission for early availability on their models, and with Buick already firmly sold on the dynaflow perhaps all GM models in the next few years will adopt the seemingly profitable combination of high-compression engines and torque-converter transmissions. That's the way the wind is blowing now.

**Lower Piston Displacement**—High specific power output of the high-compression engine results in lower piston displacement and lower friction horsepower, a significant economy factor at part load. Friction horsepower for the 12.5-1 compression ratio engine is figured at about 10.5, against 14 for the 6.5-1 engine. This is translated into a reduction of about 14 per cent in indicated horsepower at 40 mph, over and above the thermodynamic considerations. Still greater gains are realized below 40 mph, which explains the extremely favorable results of the high-compression engine in city traffic conditions where improvements as high as 50 per cent over the conventional engine have been charted.

As a signpost to the future of engine development in the automotive industry, the Campbell-Caris-Withrow paper is an intensely interesting contribution. It should provoke much debate among GM's competitors, most of which are none too certain just which way to move in respect to power plants.

## Kaiser-Frazer Sales Booming

ELATED over a 118 per cent increase in retail sales in the first six months of the year, Kaiser-Frazer officials are beginning to feel they are out of the woods which seemed to be springing up around them earlier this year. Retail sales in the two week-period ending July 3 were the highest in the history of the company and exceeded production by 90 per cent. Despite recent price advances, the 4200 K-F dealers report field stocks averaging less than two cars each.

K-F earned $6.2 million after taxes for the first half, equal to around $1.35 per share. Working capital increased in the second quarter by over $2.8 million to $28,413,715. Sales for the three-month period were $92.7 million, production for six months 93,912 units. For the last three weeks of July, output of Frazer models tapered off to almost nothing because of parts shortages, but increases were made in Kaiser schedules to bolster weekly assemblies. Frazers now have moved up on a par with the other model.

Dealers are being given 100 per cent labor reimbursement for all warranty work involving replacement of parts, compared with established industry practice of about 50 per cent.

## Packard Checks on Fuel

WITH automotive vehicles now consuming gasoline at a rate of 2,400,000 barrels a day out of a total consumption of 5,400,000 barrels of crude petroleum daily, the importance of fuel economy is thrown into sharp focus, the more so because of the vital character of motor transportation in the economic life of the United States.

Packard engineers decided recently to make some careful checks into fuel economy and driving habits. A study of 1000 new Packard owners showed mileage variations all over the map, from 15 miles or less to 22 miles or more per gallon on a 130-horsepower 8-cylinder engine with overdrive. Explanation was the driving habits of the individual.

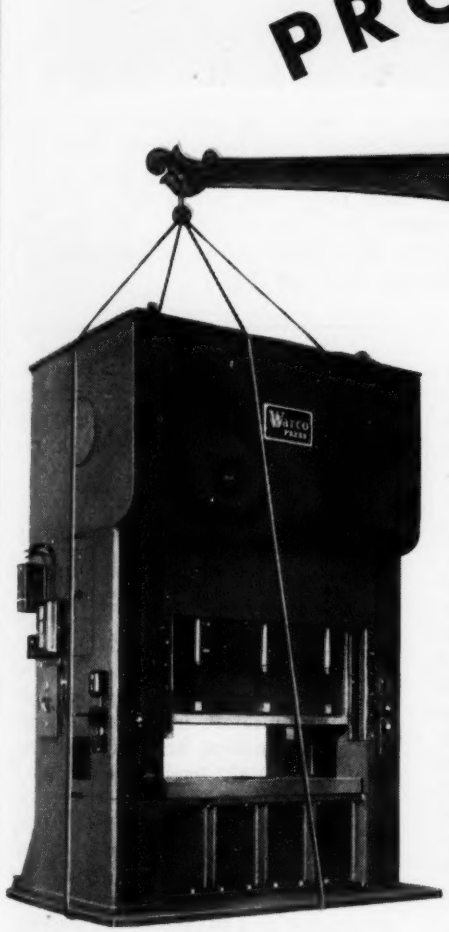
Supplementing the owner survey, the company ran a further test of two eights at its proving grounds. Moving at a steady speed and with no stops or sprint-accelerations, both averaged 19 mph. Then, both cars were nosed onto an 18-mile course and the driver of one instructed to proceed at uniform speed for the traffic-free distance, the other was told to drive in tortoise-and-hare fashion, coming to a dead stop every half mile for 10 seconds and then racing to catch the first car. Although both arrived at the finish line at the same time, the first car averaged 19 mpg, the second approximately half that figure.

## Ford Building Car Test Hill

MAN-MADE test hill is nearing completion at the Ford Motor Co. proving grounds, where a fleet of trucks has hauled 112,00 tons of open-hearth slag over a period of nine weeks to form a 45-foot hill with two inclines, one 17 per cent and the other 30 per cent. At present the slag pile is settling about 1 inch per week; when this stops it will be capped with a 24-foot ribbon of concrete, protected by 6-foot guardrails, with the sides sodded and landscaped.

# *Perfect* BALANCE

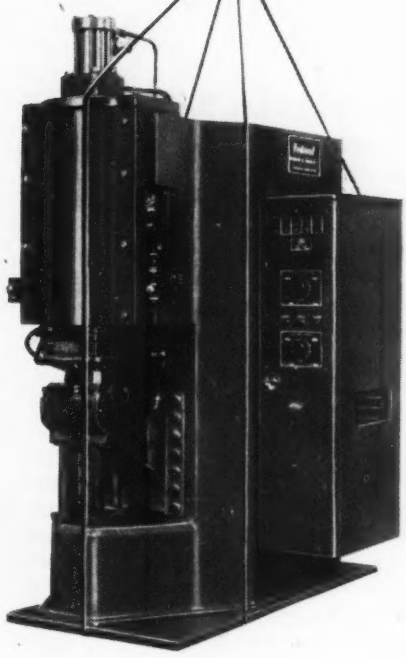
## FOR EFFICIENT PRODUCTION



Use this one dependable source with the ability and experience to supply your needs for both resistance welding equipment and presses.

Increase your production efficiency by teaming the right Warco Press and the right Federal Welder against high costs.

Federal is equipped to handle every type of metal forming or resistance welding application. Let our engineers analyze your product and show you new economies in your press and welding operations.



Warco 250 ton two point 84" Double Eccentric All-Welded Tie Rod Frame Press.

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**FROM 50-TON OBI TO 2000-TON DOUBLE ACTION**

Federal 500 KVA Hydraulic Operated Press Welder equipped with antifriction roller slide.

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## Welding Divisions Moved

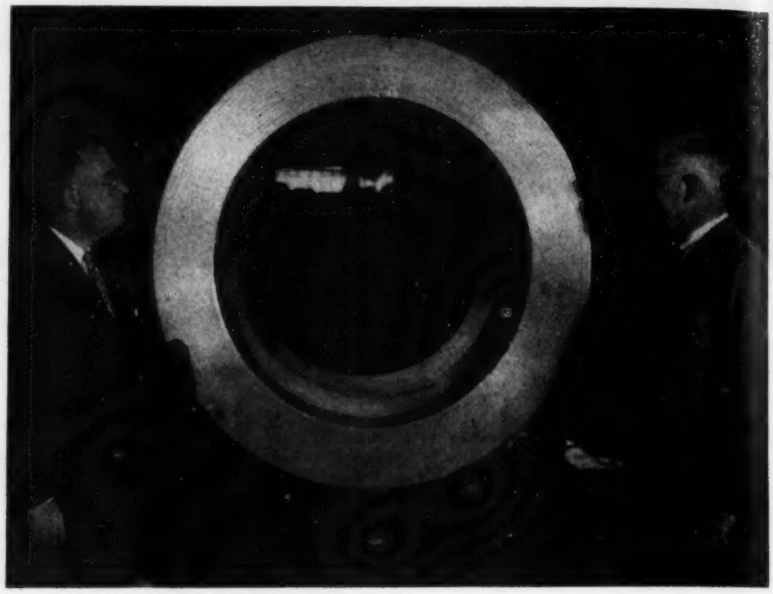
**GE completes transfer of welding facilities to New England, names sales unit for area**

TRANSFER of sales and application engineering divisions of the welding equipment divisions, General Electric Co., completes the movement of all the division's functions to the New England states.

Sales and application engineering have now joined the direct current welder plant in Fitchburg, Mass., while the alternating current welder factory was previously established in Holyoke, Mass.

Under the new organization, sale of GE welding products for the entire New England area will be handled by Welding Engineering Sales Corp., Boston. In addition, portions of western Massachusetts, Maine, Vermont and New Hampshire also will be served by direct factory sales from Fitchburg.

Line of welding products to be sold and serviced from the new location includes alternating and direct current welders and automatic machine welding equipment.



MILESTONE: This back-up roll sleeve, the 1000th one produced by the Heppenstall Co., Pittsburgh, is pridefully looked upon by company executives as a milestone in the manufacture of this type of forging used extensively in the rolling of strip steel. Inspecting it are, left to right, R. B. Heppenstall, president, and C. W. Heppenstall, vice president. The company plans to exhibit the sleeve at the Association of Iron & Steel Engineers show in Cleveland, Sept. 28-Oct. 1

## Quebec Titanium Deposits Found

DISCOVERY of large deposits of high-grade titanium ore in eastern Quebec and plans for a $25 million project to develop the find have been announced by Premier Duplessis.

Kennco Explorations Ltd., a subsidiary of Kennecott Copper Corp. and operating under a license from the provincial government, will develop the discovery. It plans to begin immediate construction of a 27-mile railroad from the north shore of the Gulf of St. Lawrence into the mineral area situated near Lake Allard 400 miles northeast of Quebec City. Kennco's prospecting party estimates there are millions of tons of the ore in the region. Besides being used in paint, the ore can be mixed with other elements to produce a metal as strong as high grade steel.

Cost of the railroad is set at $10 million, and a $12 to $15 million refinery at Sorel, Que., to treat the ore electrolytically is planned by Kennco.

## Goodrich To Build Belting Plant

B. F. GOODRICH CO. will build a multi-million dollar plant in Akron for the manufacture of industrial rubber belting.

Representing the first major expansion of production facilities in Akron by Goodrich in many years, the new plant will be erected only a few feet from the site of the original factory built in 1870. Four buildings will be razed to permit construction of the new plant which will contain 150,000 sq ft of floor space. Work will be started during August.

## Closes Indiana Harbor Plant

AMERICAN Steel Foundries, Chicago, has closed its Indiana Harbor, Ind., plant for an indefinite period because of unprofitable operations.

The closedown will not materially affect company-wide earnings, a spokesman said. The company hopes to work out plans for operating the plant on a profitable basis so it can be reopened. Principal products at Indiana Harbor were miscellaneous steel castings for railway, automotive and rolling mill equipment.

## U. S. To Build Super Liner

MARITIME Commission has issued invitations to shipyards to bid on the construction of a super liner for the United States Lines. Bids are due Nov. 1.

The new ship will be the largest and fastest American liner ever built. It will be 980 feet long and capable of accommodating more than 2000 passengers. The speed range will be up to 30 knots. U.S. Lines plans to use the vessel on North Atlantic runs. Its estimated cost is $65 million, $25 million of which will be paid by U.S. Lines and the remainder by the government in construction subsidies and for such defense features as the high speed equipment.

## Funds for Military Program

FUNDS for Corps of Engineers' current $612.7 million military program, as announced by Army Secretary Royall, have been provided by Congress under three separate appropriations as follows: Engineer services, $429 million; military construction, $151 million and supplemental construction, $32.7 million.

Included in the Engineer services appropriation are: $27,190,799 for procurement of military supplies and equipment, $9,921,767 for repair and maintenance of engineer supplies and equipment and $6,080,000 for development of equipment.

## Morgan Steel Reactivated

BUCKEYE Laboratories Inc., Cleveland, has been sold to Bowser Inc., Ft. Wayne, Ind., manufacturer of gasoline pumps, meters and other products. The fabricating end of Buckeye's business remains at the same address, 6700 Morgan Ave., Cleveland, but is now being operated under the old name of Morgan Steel Products Inc. Robert Hays Gries is president and Grant M. Illenberger is general manager of Morgan.

# Briefs . . . .

## Paragraph mentions of developments of interest and significance within the metalworking industry

**Admiral Corp.,** Chicago, has formed an International Division to handle marketing of Admiral radios, ranges and refrigerators outside the United States and Canada.

—o—

**Texas Engineering & Mfg. Co.,** Dallas, Tex., has announced a $500 increase in the price of both the deluxe and standard models of the Swift 125 airplane. New prices will be $4495 for the deluxe and $3995 for the standard.

—o—

**Engineering Foundation,** New York, has created a council to carry out studies in reinforced concrete. Studies will be used in drawing up a code for the design of concrete structures.

—o—

**Cleveland Tapping Machine Co.,** Hartville, O., manufacturer of tapping machines and related items, has appointed Milton Grandquist Co., Minneapolis, as its representative in Minnesota, western Wisconsin, northern Iowa and eastern North and South Dakota.

—o—

**Fairchild Engine & Airplane Corp.,** New York, has concluded a licensing agreement with Wellworthy Piston Rings Ltd., Lymington, Hampshire, England, covering use of Fairchild's Al-Fin process for bonding aluminum to iron, steel and other metals.

—o—

**Rapids-Standard Co. Inc.,** Grand Rapids, Mich., manufacturer of materials handling equipment, has adopted "RapiStan" as a trademark to designate its products.

—o—

**American Chemical Society,** New York, has established a new local section at Richland, Wash., where plutonium, principal source of atomic energy, is manufactured. Dr. Robert Lee Moore, General Electric Co., Richland, is chairman of the section.

—o—

**Reynolds Metals Co.,** Richmond, Va., has named American Brass & Copper Sales Co., Oakland, Calif., as a distributor in the Oakland area for special aluminum mill products.

—o—

**Lanly Co.,** Cleveland, manufacturer of heat-treating equipment, has appointed Stanley P. Rockwell Co., Hartford, Conn., as exclusive representative in New England.

—o—

**A. J. Bayer Co.,** Houston, Tex., has changed its name to Offenhauser Co. P. Offenhauser is president. The change is in name only and involves no shift in personnel, location or business. Firm fabricates iron, steel, aluminum and alloys.

—o—

**Vesuvius Crucible Co.,** Pittsburgh, manufacturer of crucibles and allied products, has appointed Interstate Sales Inc., St. Louis, as its representative in the St. Louis area.

—o—

**War Assets Administration** is asking for bids for the purchase or lease of the former Walsh-Kaiser Shipyard at Providence, R. I. Property covers 100 acres on the water front and includes 43 buildings with floor areas ranging from 1000 to 190,000 sq ft.

—o—

**United States Rubber Co.,** New York, has named Graybar Electric Co. exclusive national distributor for Uskon conductive rubber panels used in the radiant heating of homes by electricity.

—o—

**War Assets Administration** is offering the New York Ordnance Works, Baldwinsville, N. Y., for sale in whole or in part. Bids on the plant, occupying a site of 2000 acres, will be accepted until Aug. 30.

—o—

**Rust Furnace Co.,** Pittsburgh, will design and build an 85-ton per hour billet heating furnace which will replace a 40-ton unit in use since 1929 by Timken Roller Bearing Co., Canton, O. New facility will be designed for firing by either natural gas or fuel oil.

—o—

**Gray Iron Founders' Society,** Cleveland, reports formation of a Southern Group of management executives representing gray iron foundries in Texas and Arkansas. Charles R. McGrail, president, Texaloy Foundry Co., San Antonio, Tex., is chairman.

—o—

**Phelps Dodge Corp.,** New York, has purchased two plants from Reconstruction Finance Corp. The facilities, a copper reduction unit at Morenci, Ariz., and a copper refining plant at El Paso, Tex., have been operated by Phelps Dodge under lease since March, 1942.

—o—

**Federal Machine & Welder Co.,** Warren, O., manufacturer of welders and presses, has arranged to purchase the plant and facilities used by the old Warren City Mfg. Co. and now owned by the Navy. Federal has been operating this plant, in the manufacture of presses, since 1946 when it acquired the stock of Warren City.

—o—

**Lehigh University,** Bethlehem, Pa., has been awarded a five-year contract for the study of welded continuous frames applicable to building and bridge construction. Sponsors of the program are Welding Research Council, American Institute of Steel Construction and the U. S. Navy Office of Naval Research.

—o—

**Cowles Detergent Co.,** Cleveland, manufacturer of industrial chemicals, has changed its name to Cowles Chemical Co. There is no change in management, ownership or policies of the firm.

—o—

**Douglas Aircraft Co. Inc.,** Santa Monica, Calif., is experimenting with a new type military trainer plane which will feature an air cooled engine submerged completely within the fuselage. Work is proceeding under a $550,000 contract on the trainer.

—o—

**Stor-All Corp.,** Akron, has purchased a former furniture factory in Inglewood, Calif., and will convert the facility into its West Coast plant for the manufacture of portable steel storage units.

—o—

**Hagen Mfg. Co.,** has moved its plant for the manufacture of electric motors to 104 Walnut St., Baraboo, Wis., after 1½ years' operation in Belvidere, Ill. Small motors for temperature control mechanisms, recording instruments, and stoker controls are among the items manufactured.

—o—

**Tinius Olsen Testing Machine Co.,** announces a new plant and office location on Easton Rd., Willow Grove, Pa. New plant has over 100,000 square feet of floor area.

—o—

**Wolverine Tube Division,** Calumet & Hecla Consolidated Copper Co. Inc., Detroit, has published a transportation map of the United States including highways, railroads, airlines, principal cities, towns and villages. Copies may be obtained from the company without charge.

—o—

**Navy Industrial Association,** New York, and the Navy's Bureau of Supplies and Accounts will conduct a materials handling and packaging conference at Navy Supply Depot, Bayonne, N. J., Sept. 28. Conference will consist of exhibits and demonstrations.

# The Business Trend

INDUSTRIAL and business activity continues at near record levels despite summer vacations and materials shortages. In reflecting this high rate, STEEL's industrial production index edged back up to a preliminary 170 per cent of the 1936-1939 average for the week ended Aug. 14, two points above the preceding week.

Contributing to this gain was steel production which rose slightly to 94.5 per cent of capacity. Demand continued unabated in spite of price increases and dissatisfaction with f.o.b. mill pricing. All is not serene on the industrial front, however, as supplier difficulties continue to plague the automobile industry and pose a threat to continued high output.

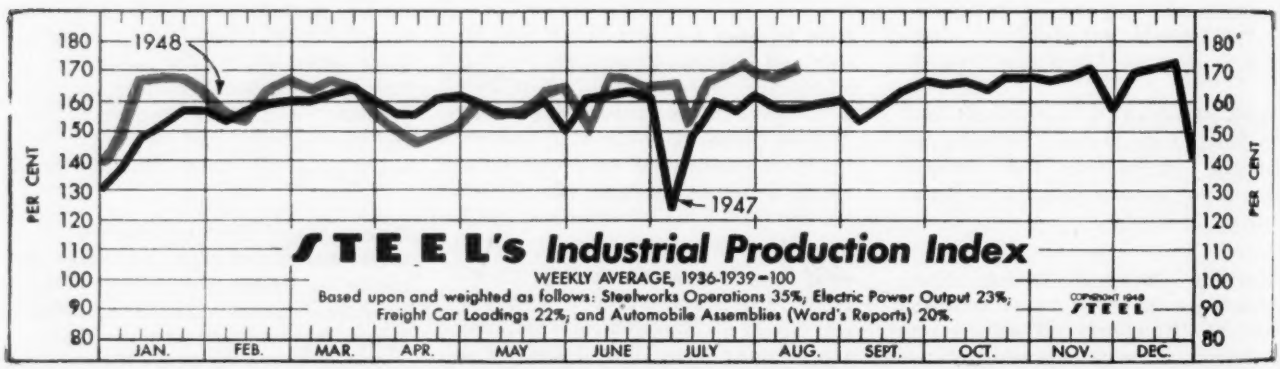
**COAL**—One of the other big factors in the continuing near record industrial output was bituminous coal production which remained at the high level of 12.2 million net tons for the week ended Aug. 7, as compared with the 11.8 million net tons in the corresponding week last year. The gap between the aggregate coal production up to the reporting date this year and the amount produced in the corresponding period last year is slowly closing. Maintenance of the present production rate should make 1948's total nearly equal that of 1947.

**AUTOMOBILES**—Recent settlement of a strike by a leading truck axle producer resulted in an upswing in truck production by several builders. Foundry strikes of long duration have caused a few of the independent producers to suspend operations with the big three of the industry maintaining output only by scraping the bottom of the component barrel. Exhaustion of the component stockpile may result in complete suspension of all passenger car output with truck programs maintained for a longer period.

**PRICES** — Reflecting continued inflation, wholesale prices reached a new postwar peak of 169.2 per cent of the 1926 average during the week ended Aug. 7, according to Bureau of Labor Statistics. Prices of raw materials, semimanufactured articles and manufactured articles went up one half of 1 per cent or more during the same period.

**FINANCE**—Net working capital of U.S. corporations continued to increase during the first quarter of 1948, reaching a new record of $62.4 billion as of Mar. 31, according to the quarterly analysis made by Securities & Exchange Commission. During the three months, January to March, working capital increased by $1.6 billion, reflecting a rise in current assets of $500 million while current liabilities declined by $1.1 billion.

**INCOME**—Also up is personal income which rose to an annual rate of $211.9 billion in June from $207.2 billion in the previous month. Commerce Department said this increase resulted from absence of major labor-management disputes, effects of third-round wage increases and higher prices received by farmers for livestock. The June increase, coupled with the reduced tax payments starting in May, had the effect of raising disposable income—the income available to consumers after payment of personal taxes—by more than 4 per cent over the first quarter of the year.




**Index (chart above): Week ended Aug. 14 (preliminary) 170 Previous Week 168 Month Ago 168 Year Ago 158**

## BAROMETERS of BUSINESS

| INDUSTRY | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Steel Ingot Output (per cent of capacity)† | 94.5 | 94.0 | 90.5 | 94.0 |
| Electric Power Distributed (million kilowatt hours) | 5,318 | 5,319 | 5,197 | 4,923 |
| Bituminous Coal Production (daily av.—1000 tons) | 2,023 | 2,068 | 1,679 | 1,968 |
| Petroleum Production (daily av.—1000 bbl.) | 5,507 | 5,505 | 5,444 | 5,159 |
| Construction Volume (ENR—Unit $1,000,000) | $194.4 | $153.6 | $126.6 | $57.4 |
| Automobile and Truck Output (Ward's—number units) | 112,102 | 108,864 | 120,741 | 79,081 |

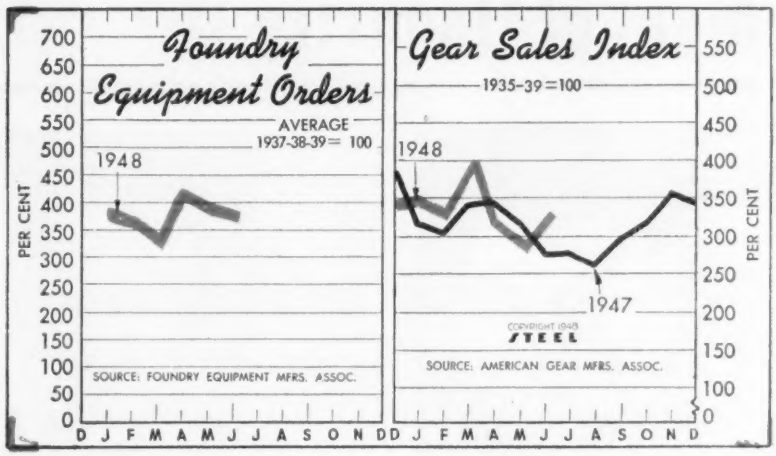
* Dates on request. †1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

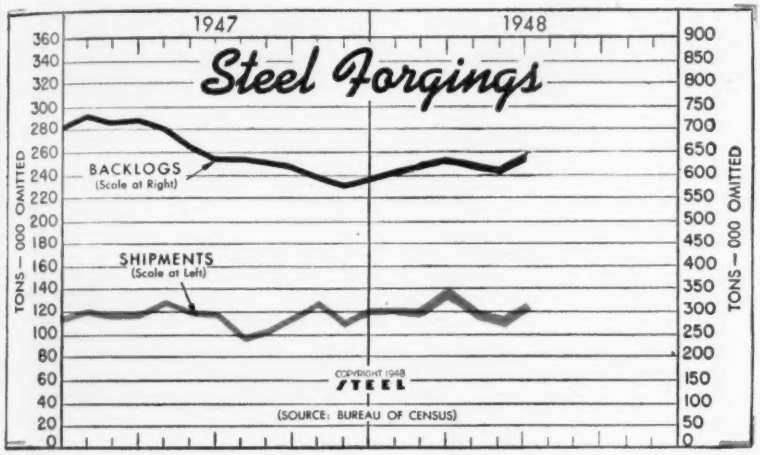
| TRADE | | | | |
|---|---|---|---|---|
| Freight Carloadings (unit—1000 cars) | 884† | 879 | 893 | 906 |
| Business Failures (Dun & Bradstreet, number) | 103 | 116 | 91 | 78 |
| Money in Circulation (in millions of dollars)‡ | $27,966 | $27,922 | $27,959 | $28,223 |
| Department Store Sales (changes from like wk. a yr. ago)‡ | +16% | +7% | −5% | −2% |

† Preliminary. ‡ Federal Reserve Board.

| | Foundry Equipment Orders* —Index— (1937-38-39=100) 1948 | Gear Sales —Index— (1935-39=100) 1948 | Gear Sales —Index— (1935-39=100) 1947 |
|---|---|---|---|
| January | 380.9 | 346.8 | 317.0 |
| February | 367.3 | 324.4 | 303.0 |
| March | 326.2 | 389.8 | 342.9 |
| April | 412.0 | 320.9 | 346.2 |
| May | 388.5 | 283.6 | 317.2 |
| June | 376.8 | 324.1 | 278.0 |
| July | .... | .... | 278.5 |
| August | .... | .... | 261.6 |
| September | .... | .... | 297.7 |
| October | .... | .... | 317.7 |
| November | .... | .... | 356.9 |
| December | .... | .... | 343.6 |

* By foundry trades only.


Foundry Equipment Orders
AVERAGE 1937-38-39=100
1948
PER CENT
SOURCE: FOUNDRY EQUIPMENT MFRS. ASSOC.
Gear Sales Index
1935-39=100
1948
1947
COPYRIGHT 1948 STEEL
SOURCE: AMERICAN GEAR MFRS. ASSOC.
PER CENT
D J F M A M J J A S O N D D J F M A M J J A S O N D




**Steel Forgings**

(Tons—000 omitted)

| | Shipments* 1948 | Shipments* 1947 | Unfilled Orders* 1948 | Unfilled Orders* 1947 |
|---|---|---|---|---|
| January | 118 | 116 | 618 | 723 |
| February | 117 | 111 | 631 | 714 |
| March | 131 | 115 | 641 | 717 |
| April | 114 | 121 | 628 | 699 |
| May | 109 | 116 | 624 | 663 |
| June | 120 | 112 | 641 | 639 |
| July | ... | 92 | ... | 631 |
| August | ... | 98 | ... | 626 |
| September | ... | 109 | ... | 617 |
| October | ... | 124 | ... | 594 |
| November | ... | 104 | ... | 586 |
| December | ... | 117 | ... | 594 |

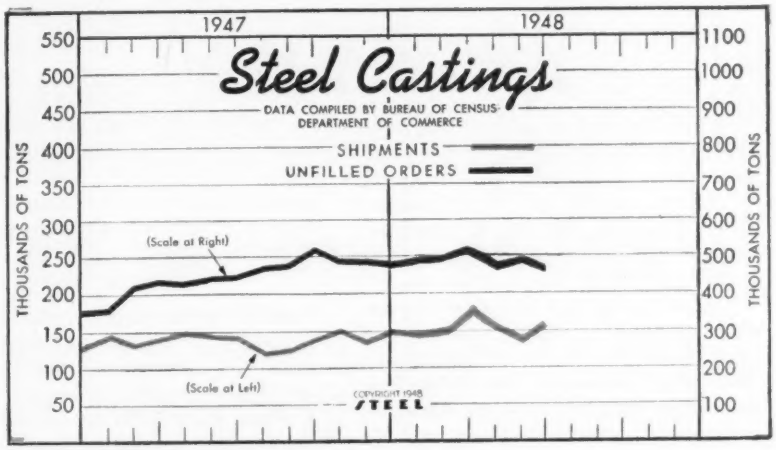
* Forgings for sale.

**Commercial Steel Castings**

(Net tons in thousands)

| | Shipments 1948 | Shipments 1947 | Unfilled Orders* 1948 | Unfilled Orders* 1947 |
|---|---|---|---|---|
| Jan. | 141.1 | 139.0 | 491.7 | 365.5 |
| Feb. | 142.4 | 125.6 | 497.1 | 421.4 |
| Mar. | 162.9 | 134.9 | 508.8 | 434.9 |
| Apr. | 150.3 | 144.2 | 472.4 | 427.6 |
| May | 143.3 | 140.9 | 482.5 | 443.2 |
| June | 152.9 | 139.0 | 470.0 | 445.5 |
| July | .... | 117.0 | .... | 473.9 |
| Aug. | .... | 120.4 | .... | 478.6 |
| Sept. | .... | 137.4 | .... | 526.2 |
| Oct. | .... | 148.4 | .... | 497.3 |
| Nov. | .... | 130.1 | .... | 493.3 |
| Dec. | .... | 148.1 | .... | 489.4 |

* Castings for sale.




## FINANCE

| | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Bank Clearings (Dun & Bradstreet—millions) | $11,917 | $13,278 | $14,083 | $11,435 |
| Federal Gross Debt (billions) | $253.2 | $253.4 | $252.9 | $259.8 |
| Bond Volume, NYSE (millions) | $13.5 | $14.4 | $19.1 | $14.2 |
| Stocks Sales, NYSE (thousands) | 3,949 | 3,863 | 7,211 | 3,662 |
| Loans and Investments (billions)† | $63.2 | $63.1 | $62.6 | $63.6 |
| United States Gov't. Obligations Held (millions)† | $35,023 | $34,870 | $34,431 | $38,735 |

† Member banks, Federal Reserve System.

## PRICES

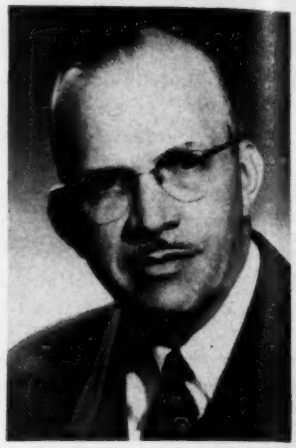
| | | | | |
|---|---|---|---|---|
| STEEL's composite finished steel price average | $93.55 | $93.55 | $80.27 | $75.41 |
| All Commodities† | 169.2 | 168.3 | 166.8 | 152.2 |
| Industrial Raw Materials† | 184.3 | 183.4 | 184.2 | 166.4 |
| Manufactured Products† | 164.3 | 163.5 | 154.0 | 147.1 |

† Bureau of Labor Statistics Index, 1926=100

# Men of Industry

FRED L. WHITE

T. F. PETERSON



DOUGLAS L. TAYLOR

**Fred L. White** has been appointed development and consulting engineer, Osgood Co., Marion, O. He formerly served as chief engineer of the company and is succeeded in that position by **John E. Callouette.** In his new capacity Mr. White will divide his full time between the home office and the field. Mr. Callouette has served as design engineer, Clark Bros. Corp., Olean, N. Y., and chief power engineer, Industrial Rayon Corp., Painesville, O.

—o—

Bailey Meter Co., Cleveland, announces that **G. L. Harman Jr.** has been appointed manager of the company's Milwaukee branch office, succeeding **R. V. Knapp,** who resigned to accept a position with Mosinee Paper Mills Co. Inc. Mr. Harman for the past few years has been attached to the company's Los Angeles branch office, where he has had wide experience in applying Bailey meters and control systems to power plants and industrial processes. In Milwaukee he will be assisted by **J. L. Andrews,** mechanical engineer, and **L. O. Smith,** service engineer.

—o—

**A. C. Wheeler** has been elected president, Seymour Mfg. Co., Seymour, Conn. Also elected to executive positions are: **Alton G. Wentworth,** executive vice president; **Bernard H. Matthies,** vice president; **Earl B. Boise,** vice president; **Charles Wohlfarth,** assistant treasurer, and **Robert W. Brown,** assistant secretary.

—o—

**Ray R. West** has been named manager of sales for products used in industrial applications, Minneapolis-Honeywell Regulator Co., Minneapolis. Associated with Brown Instrument Co., industrial division of the company, for more than 20 years, he will now make his headquarters at the Brown plant in Philadelphia.

—o—

**Walton P. Lewis** has been appointed district electrical sales engineer at Pittsburgn in a new and separate sales division which has been created to handle the electrical wire and cable products of American Steel & Wire Co., subsidiary of U. S. Steel Corp. **T. F. Peterson,** who has headed the section of the general sales staff of the company devoted to electrical products, will serve as manager of sales of the new division. Four new district sales offices under the new organization will be established in Boston, Cleveland, Chicago and New York.

—o—

**Paul Wichelhaus,** Apex Machine Tool Supply Co., Charlotte, N. C., has been appointed exclusive distributor in North and South Carolina for Barber-Colman Co.'s hobbing machines, hob sharpening machines, hobs, cutters and reamers.

—o—

Texoma Supply Co., Tulsa, Okla., has elected the following officers: **James M. Cleary,** executive vice president; **Ray H. Smith,** vice president in charge of sales; and **Warren A. Read,** secretary. These officers, plus **Richard Tull,** constitute Texoma's board of directors.

—o—

**Lawrence W. Early,** resident manager, Los Angeles office of the explosives department, Hercules Powder Co., Wilmington, Del., has been transferred to the company's Salt Lake City office. He is succeeded at Los Angeles by **Robert W. Crabtree,** formerly a sales-service representative in the San Francisco office of the explosives department.

—o—

**Douglas L. Taylor** has been appointed assistant advertising director, F. C. Russell Co., Cleveland. For 12 years Mr. Taylor was sales promotion manager of Russell Mfg. Co. of Middletown, Conn., automotive parts manufacturer, and for eight years was vice president in charge of sales for Rogers Diesel & Aircraft Corp., New York. While serving in the latter capacity, he also was vice president, Hill Diesel Engine Co. and Ideal Power Lawn Mower Co., both of Lansing, Mich. More recently Mr. Taylor served as Cleveland area manager for a large advertising specialty company.

—o—

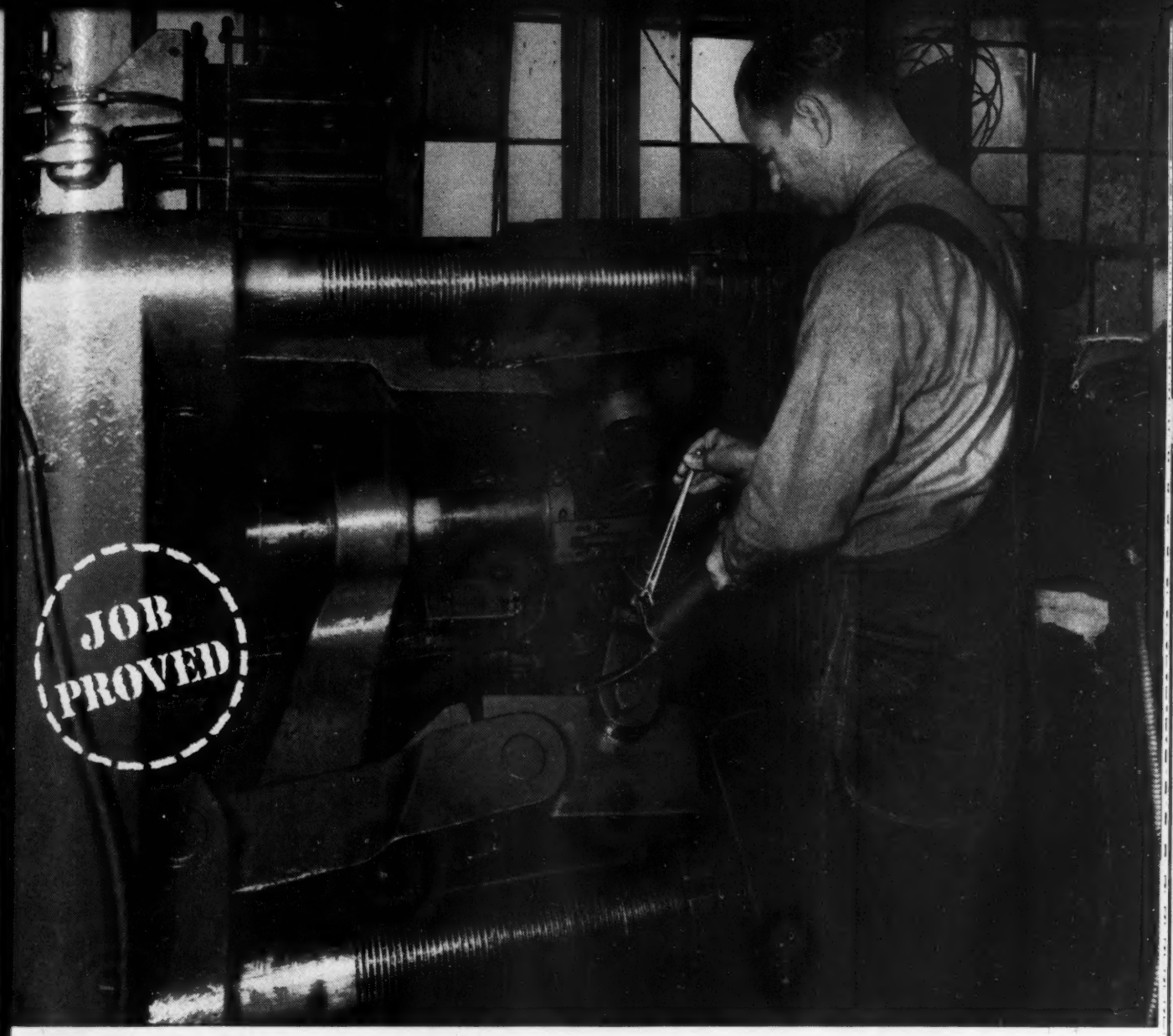
**James E. Allen,** for several years executive vice president, Aro Equipment Corp., Bryan, O., has resigned to start his own business on the West Coast representing several lines of industrial products for manufacturers in various parts of the country.

—o—

**Kenneth E. Sabine** has joined the staff of Byers Machine Co., Ravenna, O., as assistant sales manager in charge of advertising and sales promotion. He has been assistant advertising manager for Jack & Heintz Precision Industries Inc., Cleveland, since his discharge from five years' duty with the Army Air Force in 1945. He has been engaged in advertising in Cleveland since 1937.

—o—

Curtiss-Wright Corp., New York, announces the following management promotions in the Airplane & En-




# $300 SAVED IN "PIN" MONEY

## Sun Lubricant Reduces Toggle Pin Wear 70% and Minimizes Shutdowns in Die-Casting Plant

In injection-molding zinc die castings, a manufacturer was experiencing excessive wear and breakage in toggle pins. The lubricant in use, which was applied to the pins by gun, just couldn't stand up under heavy-duty operation.

Asked for his advice, a Sun engineer recommended a grease which had been "Job Proved" in many machines of the same type. Over a period of 14 months, use of this Sun grease resulted in 70 percent reduction in breakage of pins. Translated into hard cash, this represented a $300 saving. In addition, costly shutdowns for pin replacement were greatly reduced.

Records like this are not unusual in plants where Sun "Job Proved" greases and oils are used. You can rely on these lubricants to help keep equipment operating steadily and safely, with minimum time-out for maintenance. For the booklet "What Makes a Good Grease," write Dept. S-8.

**SUN OIL COMPANY** • ***Philadelphia 3, Pa.***

*In Canada:* Sun Oil Company, Ltd.
Toronto and Montreal

**SUN PETROLEUM PRODUCTS** — SUNOCO

**"JOB PROVED" IN INDUSTRY**

gine-Building Divisions of the corporation: **William C. Jordan,** formerly general manager, Curtiss-Wright Airplane Division, has been elected vice president and appointed general manager of Wright Aeronautical Corp., Wood-Ridge, N. J., the engine building division of the company. **T. B. Focke,** formerly factory manager, Curtiss-Wright Airplane Division, has been appointed general manager of that organization, succeeding Mr. Jordan. **William D. Kennedy,** vice president, Curtiss-Wright Corp., and formerly general manager, Wright Aeronautical Corp., will leave shortly for Europe to confer with military and commercial aviation officials on new aircraft and engine developments, and to inspect the company's foreign activities.

—o—

**Walter E. Mackley** has been appointed manager, New York district sales office, American Steel & Wire Co., subsidiary of U. S. Steel Corp. **F. L. Nonnenmacher** has been named manager of manufacturers' products sales, succeeding Mr. Mackley, and **Harold Christopher** has been promoted to the position of assistant manager of that department. Mr. Mackley succeeds **B. W. Bennett,** who has been named assistant to the vice president of sales. In his new capacity, Mr. Bennett will continue to maintain his office in New York, and will handle special assignments.

—o—

**Dr. Richard S. Schreiber,** research supervisor at the experiment station of E. I. du Pont de Nemours & Co., Wilmington, Del., has been elected chairman of the Delaware section, American Chemical Society.

—o—

Crucible Steel Co. of America, New York, announces appointment of **Michael Stumm** as manager in charge of its advertising department.

—o—

Latrobe Electric Steel Co., has appointed **J. C. Bigham** as district manager of sales in Philadelphia, and **R. C. Kohl** as district manager of sales in Buffalo. Mr. Bigham was formerly a sales representative in the company's Detroit office. Mr. Kohl has served as a sales representative for the company in the Buffalo area, with headquarters at Cleveland for several years. Other changes in personnel include the transfer of **T. J. Bridgeman** from the Chicago district to the Detroit district, and the transfer of **L. C. Hansen** from the Cast Alloy Division to tool steel sales in the Chicago area.

—o—

**Alton J. Hole,** for 24 years active in the automotive industry, has been appointed assistant to the general manager, Highland Park operation, Ford Motor Co., Dearborn, Mich. Mr. Hole was stamping plant superintendent, Pontiac Motor Division, General Motors Corp., prior to joining Ford. He started with Briggs Mfg. Co. in 1924, joined Ford Motor Co. at the Rouge plant in 1927, and in 1931 joined Budd Mfg. Co. He became associated with General Motors Corp. in 1933.

—o—

**Capt. Ellis H. Geiselman,** USN (retired), has joined the administrative planning staff of Willys-Overland Motors, Toledo, O. He joined Willys-Overland after a career of 31 years' commissioned service in the Navy.

—o—

**J. D. Malcolmson,** technical adviser, Robert Gair Co. Inc., New York, has been chosen to succeed the late **Edgerton A. Throckmorton,** president, Container Laboratories Inc. of Chicago, as a director and vice president, American Management Association, in charge of its Packaging Division.

—o—

**William G. Zink** has been appointed manager of the Seattle district of the Automotive, Aviation & Government Division, B. F. Goodrich Co., Akron. He has been associated for 30 years with the company, and goes to his new post from Los Angeles, where he has been assistant district manager of the division for the last two years. **Delmar F. Homer** has been appointed sales representative in the New York district, and **Gerald A. Friederici,** sales representative in the Dayton district.

—o—

McCulloch Motors Corp., Los Angeles, manufacturer of chain saws, gasoline engines, and gas heaters, has announced the appointment of **Joseph L. Hegener** as secretary-treasurer of the company. He had been comptroller since 1946, and is one of the executives who moved with the company from Milwaukee when the Los Angeles headquarters were established in that year.

—o—

The following promotions have been announced by Tennessee Coal, Iron & Railroad Co., Birmingham: **Eugene K. Graham** has been made assistant to the general superintendent, Fairfield Steel Works; **James C. Gray,** promoted to assistant manager of raw materials; and **Ellwood B. Nelson,** made general superintendent of the Coal Mines Division.

—o—

**R. J. Stockham,** vice president, Stockham Pipe Fittings Co., Birmingham, has been elected chairman of the Southern Industrial Relations Conference. He succeeds **E. J. Robeson Jr.,** vice president, Newport News Shipbuilding Co.

—o—

**Francis C. Frary,** director of research, Aluminum Co. of America, has been elected to receive the Gold Medal of the American Society for Metals for 1948, awarded for outstanding metallurgical knowledge and versatility in the application of science to the metal industry, as well as exceptional ability in the diagnosis and solution of diversified metallurgical problems.

—o—

**Robert O. Blackford** has been appointed advertising and sales promotion manager, Michigan Abrasive Co., Detroit. He joins the Detroit company after considerable service with another company in the coated abrasive field, and has formerly served in sales correspondence and branch management capacities in Grand Rapids, Toledo, Cleveland and Detroit.

—o—

**Lloyd H. Bender,** a veteran of more than 20 years in aircraft manufac-

JOSEPH L. HEGENER

ROBERT O. BLACKFORD

# Safe, Swift Handling Pays Dividends!

Yes, with finger-tip precision, one man masters ponderous loads — lifting, lowering, transporting, stacking — from any point to any other in the area served by a Trav-Lift Crane. *And all without rehandling.* With P&H variable speed push-button control you have the power, speed and versatility that pays real profits in time and money saved.

Rugged design, rigid welded construction and specially designed electrical equipment assures you of safe, dependable service for many years to come. Built by America's leading producer of overhead materials handling equipment.

Where your service requirements do not warrant investment in a heavy duty crane, the P&H Trav-Lift is the answer. Ask us to send Bulletin H-13-1.

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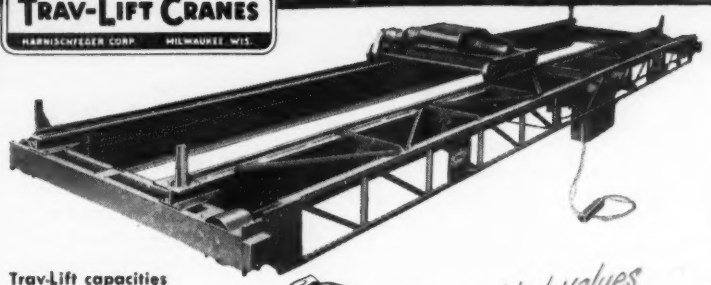
**HARNISCHFEGER CORPORATION**
ELECTRIC CRANES · EXCAVATORS · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

**P&H**
**TRAV-LIFT CRANES**
HARNISCHFEGER CORP. MILWAUKEE, WIS.



Trav-Lift capacities run up to 15 tons.

*These added values protect your investment*

**VARIABLE SPEED FULL MAGNETIC CONTROL** provides 5 distinct steps for all motions; controlled from pendant push-button or from operator's cab.

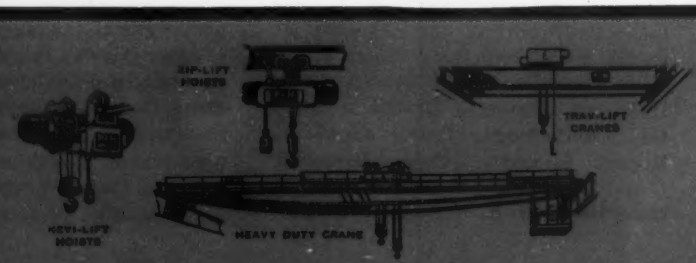
**SAFE** — Only 110 volts at the push-button when floor-controlled. Start-stop main line contactor, disconnect switch, thermal overload protection, magnetic limit switch and powerful brakes assure maximum safety.

**ALL-WELDED BRIDGE AND TROLLEY** incorporates the most important factors in reliable service — rigidity, safety, accessibility.

**LIFE-TIME CONSTRUCTION** — Motors designed specifically for crane service — high starting torque, frequent reversal, etc. Shaved gears, grease sealed anti-friction bearings throughout.

**COMPETENT ENGINEERING SERVICE** — P&H materials handling engineers will gladly bring their years of experience to bear on your particular problems. Write us.

*Handle it "thru-the-air" at lower cost*



HAROLD B. HUSTED

HAROLD E. WITHERS

DUNCAN J. MORGAN

ture, has been appointed assistant sales manager for the Swift 125 airplane, Texas Engineering & Mfg. Co., Dallas, Tex., succeeding **Leonard Larson.** Mr. Bender, who has handled service operations, will head both the sales and service organizations.

—o—

B. F. Goodrich Chemical Co., Cleveland, announces appointment of **H. F. Miller** as plants production manager with headquarters in Cleveland; **H. B. Warner,** plant manager of Avon Lake, O., Experimental Station; and **F. C. Hands,** succeeding Mr. Miller as plant manager of Plant 3 in Akron.

—o—

**W. L. Manly** has been appointed manager of dealer sales, Allis-Chalmers Mfg. Co., Milwaukee, succeeding **W. A. Meyer,** who has been named assistant manager, Texrope Drive department.

—o—

**Hobart M. Brown,** assistant secretary and treasurer, Toledo Steel Products Co., Toledo, O., has been elected vice president of the Toledo Control of the Controllers Institute of America. **M. D. Wells,** comptroller, Carnegie-Illinois Steel Corp., was similarly honored by the institute's Pittsburgh Control, which also elected **William F. Dickson,** account planning supervisor, U. S. Steel Corp.; **Paul E. Shroads,** assistant treasurer, National Steel Corp., and **E. L. Resler,** assistant controller, Jones & Laughlin Steel Corp., to its board of directors. **Gregory M. Layne,** controller, Mid-States Steel & Wire Co., Crawfordsville, Ind., is the new treasurer of the Indianapolis Control. At recent meetings of their respective Controls, the following industry executives were chosen directors: **Cornelius Bolen,** secretary and treasurer, Converse Bridge & Steel Co., Chattanooga, Tenn.; **James E. Brown,** treasurer, Cooper-Bessemer Corp., Mt. Vernon, O., Columbus Control; **Kenneth B. Coates,** treasurer, Great Lakes Steel Corp., and **Rodger A. Yoder,** secretary-treasurer, Detroit Steel Corp., both of Detroit; **Joseph B. Lanterman,** comptroller, American Steel Foundries, Chicago, and **Lawrence D. Luey,** comptroller, Connors Steel Co., Birmingham.

—o—

Lombard Corp., Youngstown, announces appointment of **Harold B. Husted** as chief structural engineer, and appointment of **Harold E. Withers** as assistant chief engineer of the corporation. Both are registered professional engineers in Ohio.

—o—

**Robert L. Stubbs,** expert on Cecostamping and sheet metal fabrication, has been retained by Chambersburg Engineering Co., Chambersburg, Pa., originators of the Cecostamp. He operated the first Cecostamp delivered to Consolidated Aircraft in San Diego in 1937; set up a department of 30 Cecostamps for Bell Aircraft Corp., Buffalo, which he operated during the war until 1944, when he became superintendent of metal fabrication, subassembly and welding at ACF-Brill Motors Corp., Philadelphia. In 1947 Mr. Stubbs engaged in consulting work on Cecostamping and similar problems.

—o—

**Conda P. Boggs** has been elected president, Victor Electric Products Inc., Cincinnati, a subsidiary of W. L. Maxson Corp., engineer and manufacturer. Mr. Boggs has resigned as vice president, Sylvania Electric Products Inc., to assume the new post.

—o—

Personnel changes naming new branch and regional managers for Minneapolis-Honeywell Regulator Co. and its Industrial Division, Brown Instrument Co., have been announced by the company. **Warren Jennings,** vice president in charge of the Boston office and its sub-branches, has asked to be relieved of some of his responsibilities after 35 years' service with the company, and is succeeded as Boston manager by **George D. Maves,** who was formerly mountain regional manager, with headquarters in Denver. Mr. Jennings continues as vice president and consultant. Succeeding Mr. Maves in Denver is **Edwin A. Thompson,** who has been promoted from the Peoria, Ill., branch managership. **Robert H. Jacobs** has been named Peoria manager.

—o—

**Duncan J. Morgan,** well-known in the manufacturing, management and investment fields, has been appointed director of human relations for ATF Inc., Elizabeth, N. J. He succeeds **B. F. McClancy,** who has become general manager of the Associated Industries, Cleveland. Mr. Morgan has been administrative assistant to the president of Illinois Tool Works, Chicago.

—o—

Seattle-Boeing Airplane Co., Seattle, announces the following personnel promotions: **Edward C. Wells,** formerly vice president, chief engineer, promoted to vice president of engineering; **Lysle Wood,** formerly assistant chief engineer, to chief engineer; **N. D. Showalter,** formerly chief, flight test department, Engineering Division, to assistant chief engineer.

—o—

**Ercell R. Stevens,** Norton Co., Worcester, Mass., has been appointed abrasive grain engineer in the Chicago district. The area, formerly covered by **W. T. Seiter,** has been divided into two territories which will be covered by Mr. Seiter and Mr. Stevens.

—o—

**Edward H. Fries,** assistant secretary, Keokuk Electro-Metals Co., Keokuk, Iowa, has been elected vice president, Quad-Cities Control, Controllers Institute of America. **Charles G. Dud-**

ley, controller, Cavalier Corp., has been named secretary-treasurer of the institute's Chattanooga Control. At the recent meeting of the Buffalo Control, **Harold L. Geibke,** secretary and treasurer, Electro Refractories & Alloys Corp., was elected secretary, and **Paul J. Kremer,** controller and assistant treasurer, Buffalo Slag Co. Inc., was named a director. **Vernard D. Hanna,** assistant secretary and assistant treasurer, Wolverine Tube Division, Calumet & Hecla Consolidated, has been re-elected to the board of directors of the Detroit Control. **M. M. Schratz,** controller, Aluminum Co. of America, is a director, Pittsburgh Control.

—o—

**Grant M. Illenberger** has been appointed general manager, Morgan Steel Products Inc., Cleveland. **H. E. Benhoff** has left the employ of the company.

—o—

**Walter W. Kemphert** has been elected vice president of sales, Skilsaw Inc., Chicago, and **J. J. Topolinski,** works manager, has been named vice president of manufacturing. Mr. Kemphert joined the organization after 20 years' association with Worthington Pump & Machinery Corp., Harrison, N. J.

—o—

**Harris T. Gregg,** manager, Houston, Tex., branch of Metal Goods Corp., has recently been elected a vice president.

—o—

**R. E. Yates, Gorman E. Hunt Jr.,** and **Joseph Conrad** have been appointed to handle dealer accounts for General Machinery Division, Allis-Chalmers

A. E. WHYMAN

*Elected vice president in charge of European operations, E. W. Bliss Co., Detroit. Noted in STEEL, August 16 issue, p. 82*

Mfg. Co., Milwaukee, in the company's Portland, Oreg., Kansas City, Mo., and Pittsburgh district office areas, respectively. **T. J. Hodan,** water conditioning department sales representative in the Milwaukee district office, has been named manager of the company's water conditioning department. Mr. Hodan succeeds **W. L. Manly,** who has been named manager of Allis-Chalmers dealer sales.

—o—

**Lewis W. Metzger,** vice president, was named executive assistant to **Marvin W. Smith,** executive vice president, Baldwin Locomotive Works, Pittsburgh. **James R. Weaver** has been appointed manager of manufacturing, and **John S. Newton,** manager of engineering, Eddystone Division. Both Mr. Weaver and Mr. Newton have previously been connected with Westinghouse Electric Corp., Pittsburgh.

—o—

**C. B. Dick** has been appointed works manager, East Springfield Works, Westinghouse Electric Corp., Pittsburgh.

—o—

**John E. N. Hume,** commercial vice president, General Electric Co., Schenectady, N. Y., has retired from the company after 41 years' service. He joined the company in 1907. Mr. Hume is widely known in the mining and steel industries, and for many years has been a key figure in mine and steel mill electrification.

—o—

**Peter Telfair** has joined F. W. Berk & Co., New York, as sales and technical development head of the company's newly formed Zirconium Division. Mr. Telfair was with the sales department of Bethlehem Steel Corp.

—o—

**Gordon Austin** has been appointed as a salesman in the Philadelphia office of Berger Mfg. Division, Republic Steel Corp. He has been with the division in the sales department of its general office in Canton.

—o—

**Charles C. Bush** has been appointed manager of the Cincinnati Division, General Box Co., succeeding the late **E. C. Marshall.** Mr. Bush formerly represented the company in Chicago and Milwaukee.

—o—

**Arthur L. Perkins** has been appointed eastern representative, Hammond Machinery Builders Inc., Kalamazoo, Mich.

## OBITUARIES . . .

**Herbert C. Greer,** 71, president, Greer Steel Co. and Reeves Steel & Mfg. Co., Dover, O., died recently at his home in Morgantown, W. Va. He was also publisher of the Morgantown *Dominion News* and the *Morgantown Post.* Following graduation from Massachusetts Institute of Technology in 1899 Mr. Greer entered the steel industry, being connected in various executive capacities with such companies as National Steel Co., Sharon, Pa., the Tennessee Coal & Iron Co., and the LaBelle Iron Works, Steubenville, O. In 1918 he organized the Greer Steel Co., Dover, O.

—o—

**John MacLetchie,** 80, general auditor, American Metal Co., New York, died recently.

—o—

**Kurt Emde,** 46, chief mechanical engineer, Zenith Radio Corp., Chicago, died recently following a heart attack.

—o—

**Lawrence M. Druckenbrod,** 62, district manager in Cleveland for the Austin Co., with which he had been associated for 32 years, died of a heart attack Aug. 14.

—o—

**William W. Nichols,** 87, former vice president, Allis-Chalmers Mfg. Co., Milwaukee, in the New York office, died Aug. 13 at his home in Scarsdale, N. Y.

—o—

**Roy Slaughter,** 55, Indianapolis district sales manager since 1931, Crucible Steel Co. of America, died Aug. 16. He had been in the sales department at Crucible 32 years.

—o—

**Theodore D. Stewart,** 59, active in the automotive industry for over 30 years, and formerly vice president of the Falls Spring & Wire Co., Detroit, died in that city Aug. 11.

—o—

**W. J. Dorworth,** 67, manager of the Atlantic district of the apparatus department, General Electric Co., until his retirement last January, died Aug. 12 at Bellefonte, Pa.

—o—

**Ross W. McKinstry,** 51, vice president, Metro Tool & Gage Co. and Sterling Products Co. Inc., both of Chicago, died Aug. 11.

—o—

**Edward M. Whiting,** 58, president, Pheoll Mfg. Co., Chicago, died Aug. 11 in Oak Park, Ill. Associated with the company since 1913, he became president in 1945.

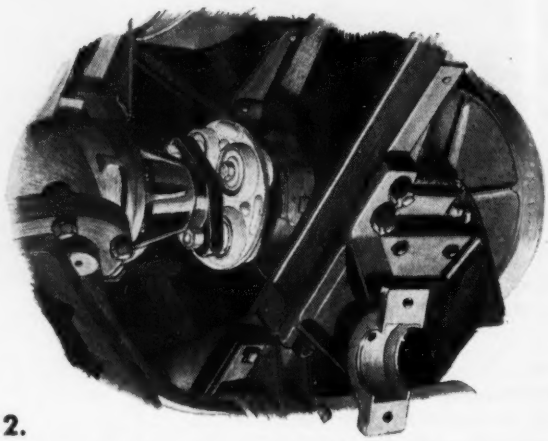
—o—

**Thomas D. Hogan,** 47, president, Orme Co., Michigan City, Ind., died Aug. 15.

# Want to reap a harvest in your business?

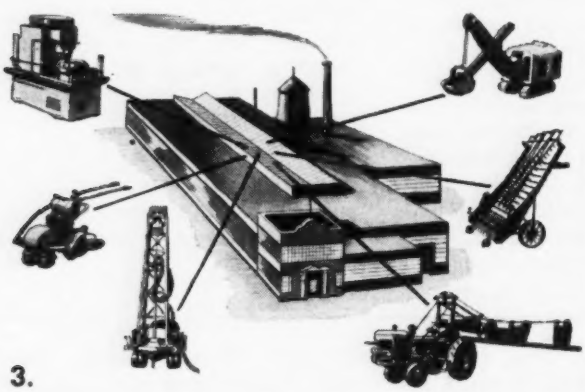
1.

**Wanted: a one-man crew** to harvest grain in labor-short areas. Cockshutt Plow Co., Ltd., Brantford, Ont., built such a harvesting combine. But trouble-free operation had to be assured on such vital turning parts as the shaft between transmission and differential. Needed: a flexible coupling to absorb shock and vibration, increase shaft life, yet withstand grit, chaff and moisture. Impossible?...



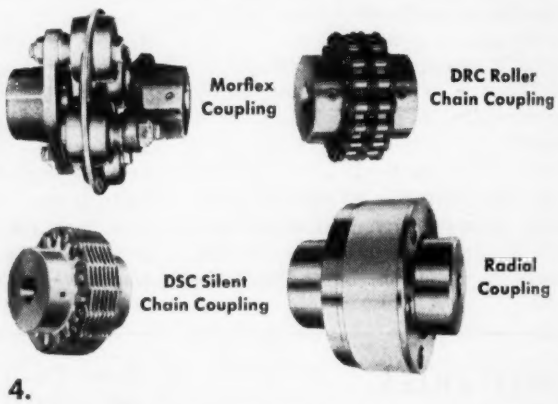
2.

**Cockshutt Plow's unusual coupling** need was quickly filled by Morse Morflex Couplings. Shockproof, quiet, compact—they take all the kicks the combine gives, *and compensate for misalignment.* Other Morse Couplings—Silent and Roller Chain, 'Junior' and Double Morflex, Radial and Marine Morflex—are made to thresh out particular problems in *your* business. Just . . .



3.

**Look how Morse** couplings have been applied to such diversified uses as machine tools, material handling lifts, oil wells, power shovels and conveyors. In your plant or on your consumer product, *Morse couplings speed production, eliminate bearing wear, protect equipment and workers.* For that extra attractive addition that makes your consumer products sell, investigate Morse Couplings, right now. Perhaps . . .




4.

**You'll get plenty** of bright ideas for coupling uses from a set of Morse coupling catalogs. Address: Dept. 207, Morse Chain Co., 7601 Central Ave., Detroit 8, Mich. Or, for on-the-spot engineering advice and aid, write or wire—trained and experienced Morse Sales Engineers will call on you. Ask to see and hear more about the entire line of Morse Mechanical Power Transmission products.

Roller Chain Drives

Morse-Rockford Friction Clutches

Silent Chain Drives

**MORSE**

**MECHANICAL POWER TRANSMISSION PRODUCTS**

A PRODUCT OF B-W BORG-WARNER

Morse-Formsprag Over-Running Clutches

MORSE CHAIN COMPANY • DETROIT 8, MICHIGAN

# Engineering News . . . AT A GLANCE

**"UNDERPASS" SHAVING—** Besides eliminating shoulder interference, underpass shaving technique employed at New Process Gear Corp., Syracuse, N. Y., cuts in half time required to finish helical shoulder gears used in a popular make ½-ton truck. Machine used in the operation is a standard Michigan Tool rotary shaver which is automatic except for loading. Typical gear for the truck transmission includes 17 teeth with a 34-degree left hand helix angle. Its diametral pitch is 7.954; pressure angle 20 degrees and pitch diameter 2.137-inches.

**SMALL ITEM WITH MANY OPERATIONS—** Despite the automotive spark plug's simple construction, the more than 100 operations necessary to make one are carried out with painstaking precision. Micro-projecting devices capable of checking curves, angles and shapes to one one-hundred thousandth of an inch, and optical flats and gage blocks able to check any object under 2 feet to within four millionths of an inch are typical units. Much of the industry's success, however, can be attributed to development of steels that may be machined and formed rapidly. Such steel used for the plug's steels may be either a bessemer or a free-cutting low carbon, open-hearth grade.

**SPEEDY TIP-BRAZING—** Brazing of carbide tool tips is being done 500 per cent faster in the plant of U. S. Carbide Tool Inc., Cleveland, since the installation of a 2-station induction heating unit. The machine enables an operator to place a "setup" in one of its two fixtures while induction heat is being applied to the other. In alternating between the two stations one operator can braze in 2 hours the same number of carbide tips to tools that formerly represented a full day's work. Brazing of a carbide tip to a ½-inch turning tool for lathe work, for example, required 2 minutes to complete the joint with the previous method. Today, the same job is done in 10 seconds.

**NO "PERFECT ROUND" NEEDED—** An "irregularly spherical" ball is better than a perfect sphere, a rod or a slug when it comes to doing a faster, better job of ball-mill grinding. That was the final conclusion drawn by engineers of H. K. Porter Co. experimenting on the subject. Therefore, the Pittsburgh company's newest steel ball is like a sphere pushed out of shape—with flattened areas here and there on its surface. The surfaces are said to present broad areas of impact in comparison with the single-point contact of the perfect sphere—insuring positive grinding action, increasing thoroughness and speed of grinding.

**DIVIDEND-PAYING PROCEDURE—** All plating is done on fully automatic machines where current, time, temperature and other variables are controlled automatically in the plant of Kuehne Mfg. Co., Mattoon, Ill., metal furniture fabricators. Close control is exercised over all solutions, and a separate generator is used on each electrified tank. In addition, a system of alarms "guards" every processing step. Nickel plating directly on the steel tubing is carried out in a 30,000-gallon tank with current and time set to assure minimum thickness of 0.0008-inch. Before nickel plating, and again before applying chromium flash, elaborate and closely controlled cleaning operations are included as part of the automatic cycle. Chromium is plated from standard acid-sulphate bath to yield required thickness of about 0.00001-inch.

**AIDS TROUBLESHOOTING** — Good rule to follow in plants involved with finishing of metal products is to sample all organic finishing materials when they are received from the supplier. If materials are not tested until the user is ready to apply them, there is always the possibility that the finisher will find himself with only unsatisfactory materials on hand, causing unnecessary production delays. Furthermore, information obtained from receiving tests is invaluable in diagnosing troubles in production which occur in every finishing department. (p. 77)

**LOW NITROGEN PICKUP** — One large steel company experimenting with a side-blow converter of 11-ton capacity produced an excellent grade of steel, keeping nitrogen pickup to a mere fraction of that for bottom-blow operation. Many of the heats showed as little as 0.003 per cent. According to A. W. Gregg, executive engineer, Whiting Corp., Harvey, Ill., side-blow operation is very similar to that for the standard bessemer. Blowing operation is slower but the chemical reactions are identical. (p. 98)

**ELIMINATES DISTORTION—** Among recommendations suggested by Linde Air Products Co. for welding aluminum fuel tanks is one that concerns wrapping sheet forming. Wrapping sheet, it is pointed out, should be formed over the tank heads and the latter tack welded to the wrapper sheet starting in the center where wrapper sheet contacts each head, working around both sides until the longitudinal seam is reached. Longitudinal seams then should be tacked starting from center and working out toward edges. Procedure is said to eliminate most of the distortion for final welding. (p. 104)

**INSERTS JUMP DIE LIFE**—Use of inserts on a pair of saddle dies used in connection with a mandrel for bending U-bolts is responsible for a die life increase of more than 600 per cent in the plant of Oliver Iron & Steel Corp., Pittsburgh. According to Frederick Lovell, general foreman, the inserts on the traveling saddle dies enable the dies to turn out better than 75,000 pieces—some 65,000 additional pieces than previously. (p. 108)

By GUY HUBBARD
*Machine Tool Editor, STEEL*

# Hydraulic Transfer, Locating and Clamping

## Expedite Manifold Production in Multi-Station Machine

TYPICAL of valuable help to the automobile industry, in the way of equipment for mechanized production, by the special machine tool industry, is the 13-station transfer type machine whose step-by-step operations are illustrated herewith. This machine, designed and built by Snyder Tool & Engineering Co., Detroit, has just gone into service on production of the unique water and intake manifold for the Kettering engine, shown in finished condition in Fig. 1.

Some idea of the size of this machine which weighs 89,000 pounds and occupies 369 x 128 inches of floor space, can be gained from Fig. 2, which was made as Clarence Snyder (left), chairman of the board of the builder company, was explaining the machine to R. F. Gietzel and K. L. Avon during its final test.

Manifolds come to this machine with lower surfaces milled. They enter, milled side down, on a roller conveyor, Fig. 3. This has a hand-operated gate for admitting parts one at a time to the first work station, where endwise location is accomplished by clamping fingers acting on cast-on locating buttons.

At this first station, Figs. 3 and 4, subland drills drill and ream two locating holes by which the parts are positioned by pins from below in all subsequent operations. At the second work station, three bosses are being spot faced—the part having been moved on from station No. 1 by the shuttle action of the reciprocating hydraulic feed rod which rolls over and thus gets its feed fingers out of the way as it retracts.

Fig. 5 is a closeup of machining stations Nos. 3 and 4 handled by one multiple head. At the left (No. 3) three ½-inch diameter holes are being drilled. At the right a milling head is about to finish the slot and three bosses are about to be spot faced.

Machining stations Nos. 5 and 6, Fig. 6, as in previous cases are served by one multiple head and one jig plate. At station No. 5, right, a 1/16-inch hole is being core drilled and ten holes are being drilled. Station No. 6, left, core drilling, chamfering, counterboring and drilling are being accomplished.

In Fig. 7, station No. 7, left, six 0.261-inch holes and two ¼-inch holes are being drilled while four 0.316-inch holes are being countersunk. At station No. 8, right, ten holes are being tapped from above while an 11/32-inch hole is being drilled by a side head.

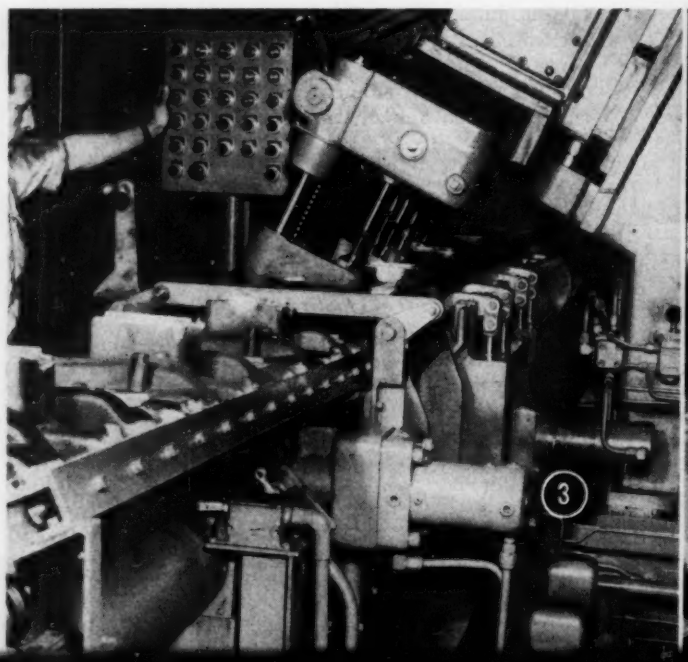
Glimpses of machining stations Nos. 9, 10 and 11 are given in Fig. 8. At station No. 9, right, a reamer is coming in from the side head at back, at station No. 10, center, a drill—not visible—is coming in from the

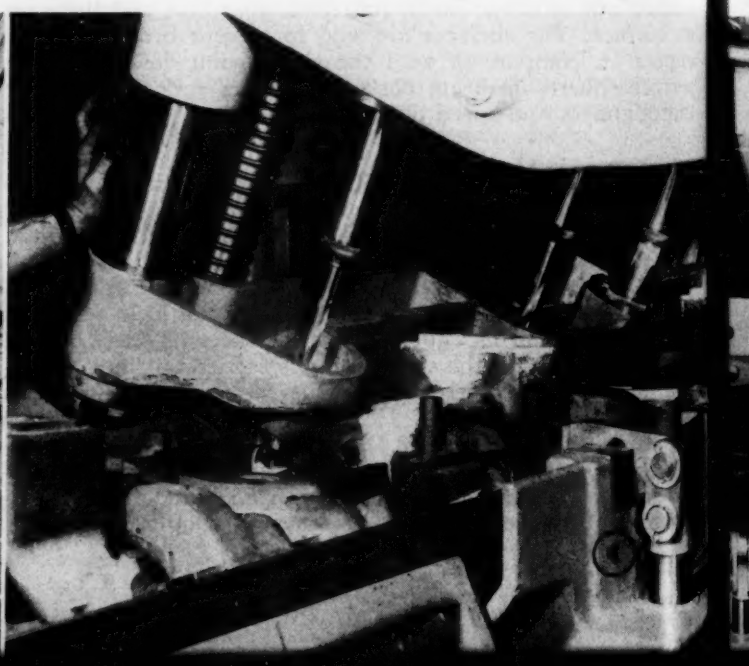
*Fig. 1—This is top view of water and intake manifold as it appears after machining. Small bosses at the two ends are foundry cast locating buttons for endwise clamping of part while exact positioning holes are machined at station one*

*Fig. 2—Holding miniature scale model, Clarence Snyder (left) explains station-to-station action of machine. Group stands at "entering" end at left side of roller conveyor and camera view is "down the production line"*



Photos by Dan Reebel



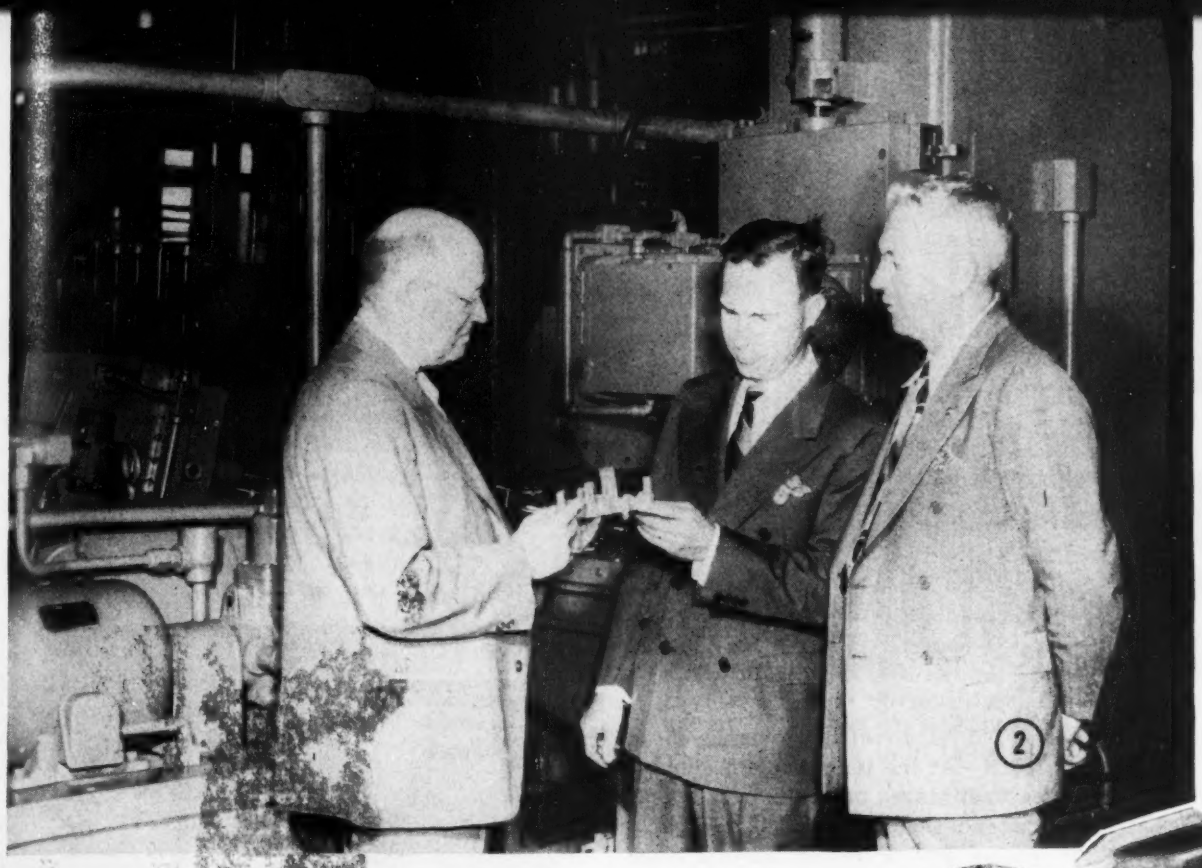
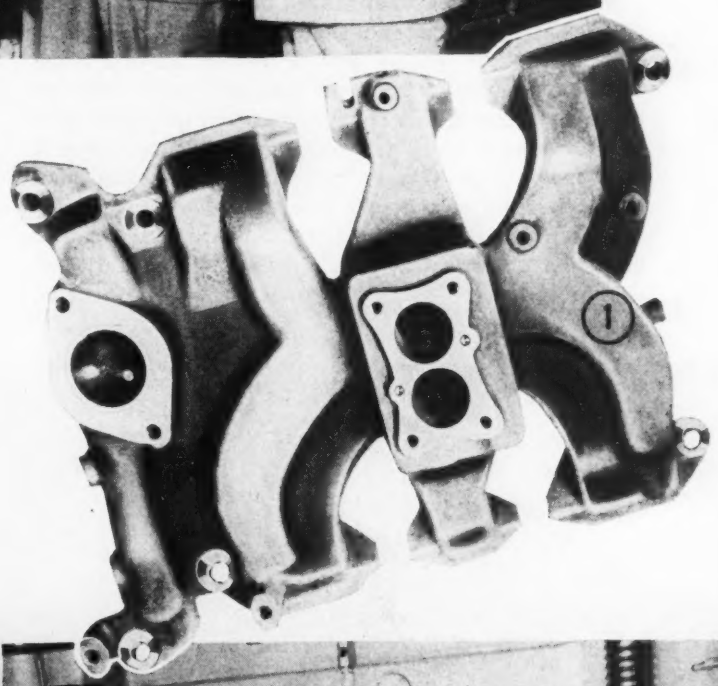


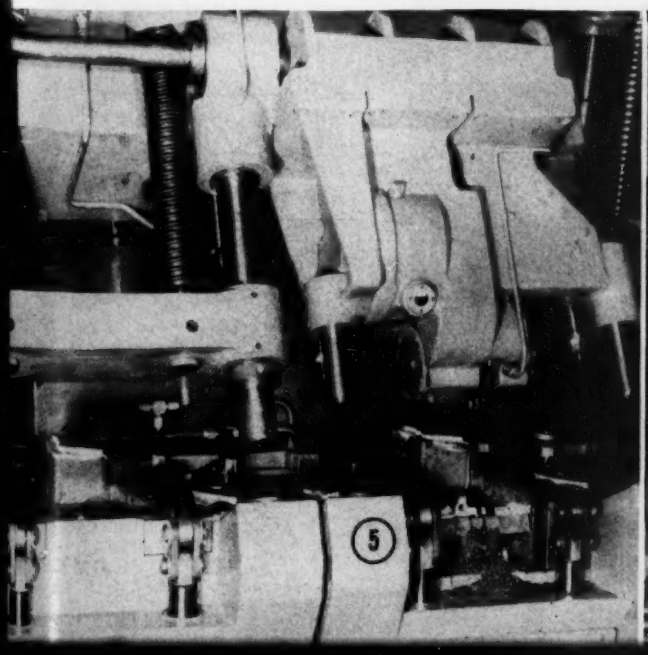

*Fig. 3—Operator at control panel at "entering" end of machine, has just released a manifold casting from roller conveyor into first machining station where locating holes are drilled and reamed*

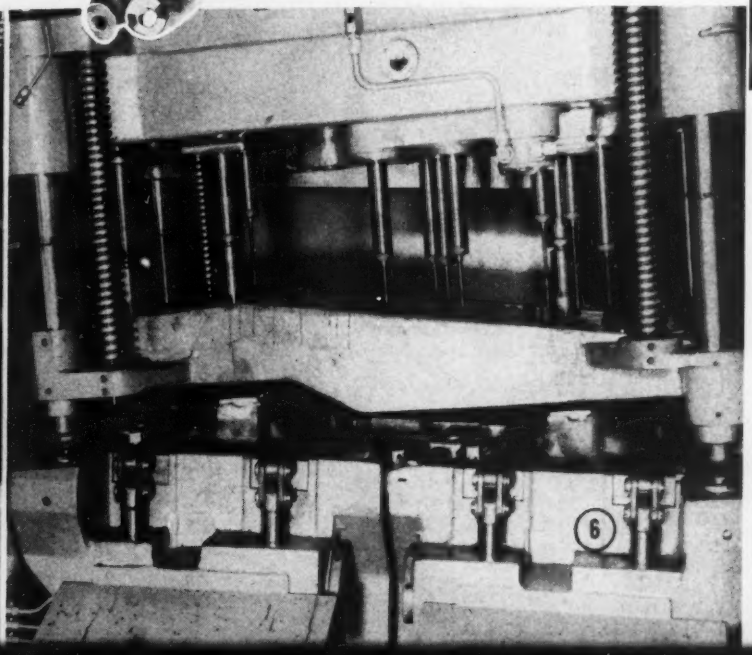
*Fig. 4—Closeup of machining stations one and two, showing two of four compensated hydraulically operated fingers gripping work at station two. At this point locating holes drilled and reamed at left have come into action*

*Fig. 5—This is closeup of stations three and four with tools and jig plate retracted. Operations at left (No. 3) consist of drilling three ½-inch holes, while at right (No. 4) a slot is milled and three bosses are spot faced*

*Fig. 6—Handled by one head operating in conjunction with a plate of unusual shape, stations five and six, respectively, involve one core drilling and four drilling operations (right) and one drilling, one core drilling and one combined core drilling, chamfering and counterboring operation (left)*



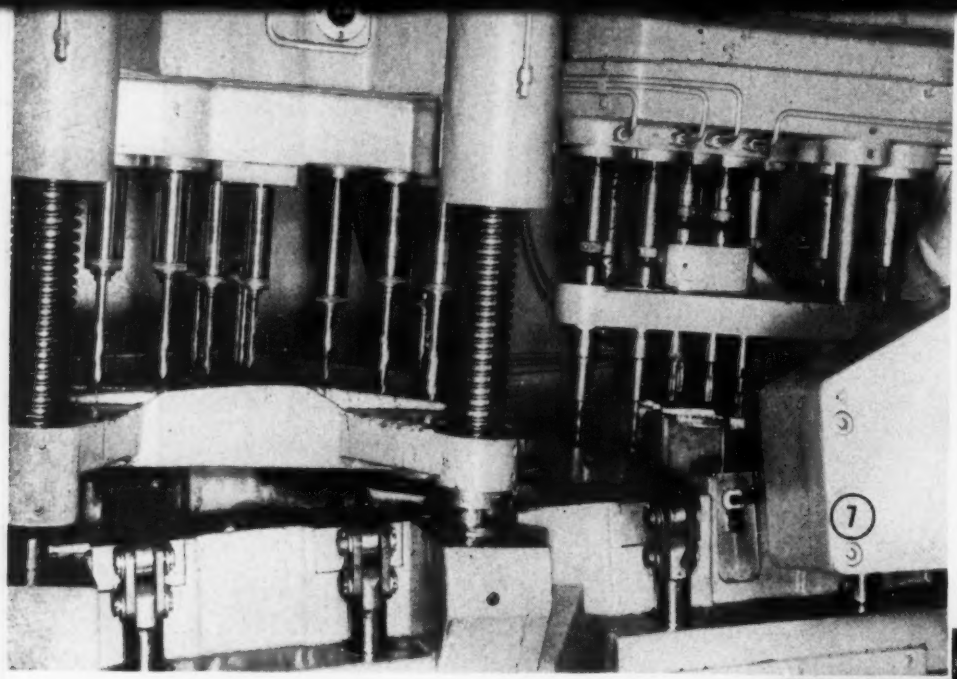
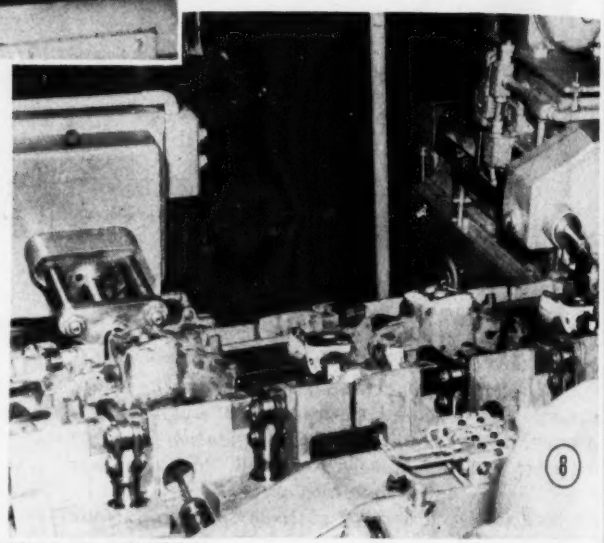


*Fig. 7—Station seven (left) involves ten countersinking and two drilling operations, while at station eight (right) ten holes are tapped and a side hole is drilled. All tapping spindles have individual lead screws and safety drives to prevent tap breakage*

front and at station No. 11 a reamer is coming in on the side head at front. At the rear a hole is tapped.

Fig. 9 illustrates final stages of the No. 11 operations. End drilling and chamfering is done from a head facing the line of flow of parts. At this stage complete unloading platform and drill head move to one side. This allows room for bottom of upper head to enter empty portion of unloading platform while it taps part just previously drilled. When tapping head rises, transfer mechanism unloads a part on unloading platform, then unloading platform and drilling head shuttle back into position for drilling and ejection of completed part. Time per piece is 48 seconds.



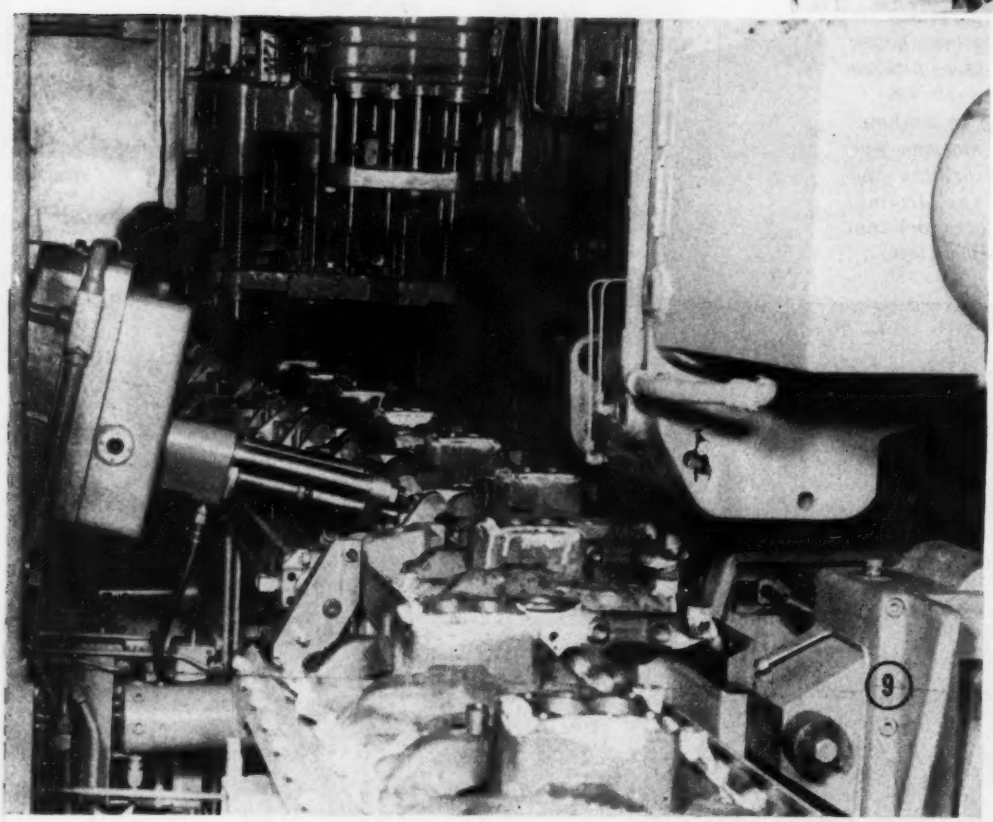


*Fig. 8—In this view of stations nine, ten and eleven, a reamer is coming in from the back at station nine (right), drilling from front occurs at station ten (center) and front reaming and rear tapping is done at station eleven (left)*

*Fig. 9—Here at the outgoing end of the machine the problem of two objects occupying the same space is solved by a shuttling table which gets the end drilling head out of the way so that the end tapping head can come into play. At this point chips are blown out of cored holes and finished part is ejected—time per piece 43 seconds at 80 per cent efficiency*

# Organic Finishes

## For Metal Products

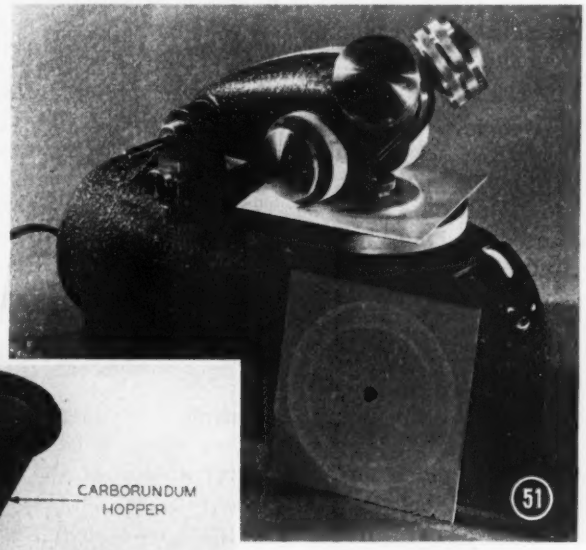
*This concluding section of the series is devoted to abrasion, impact, adhesion and heat resistance testing, and to a discussion of the electrographic technique for porosity evaluation of protective coatings. Means of effective control over application, processing and handling of finished products are also recommended*

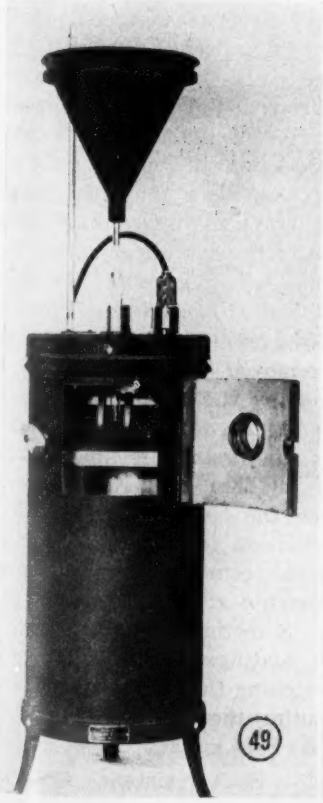
**Previous articles in the current organic finishing series appeared in the following issues of STEEL: May 17, p. 77; May 31, p. 56; June 14, p. 96; June 28, p. 81; July 12, p. 97; July 26, p. 71; Aug. 9, p. 83.**

INFORMATION on the strength of organic coatings, when examined as attached coatings is obtained by measuring their resistance to abrasion under suitable test conditions.[61] Several types of tests have been developed, those using abrasive wheels such as the Taber Abrasiometer and those based upon the impingement of abrasive upon the test specimen.

A method based on the impingement of jet-driven abrasive particles has been developed and used at the Bell Telephone laboratories as is illustrated in Figs. 49 and 50. A controlled blast of graded Carborundum is driven against the test panel, at an angle of 45 degrees, and from the amount of abrasion required to wear through the coating a measure of the abrasion resistance is obtained. In the impingement type of abrasion test it has been pointed out[57] that soft rubbery materials may give large values for abrasion resistance because the particles bounce off the surface of the test specimens.

This illustrates the necessity for integrating the knowledge obtained from one test with that obtained with others such as scratch, adhesion, hardness etc.



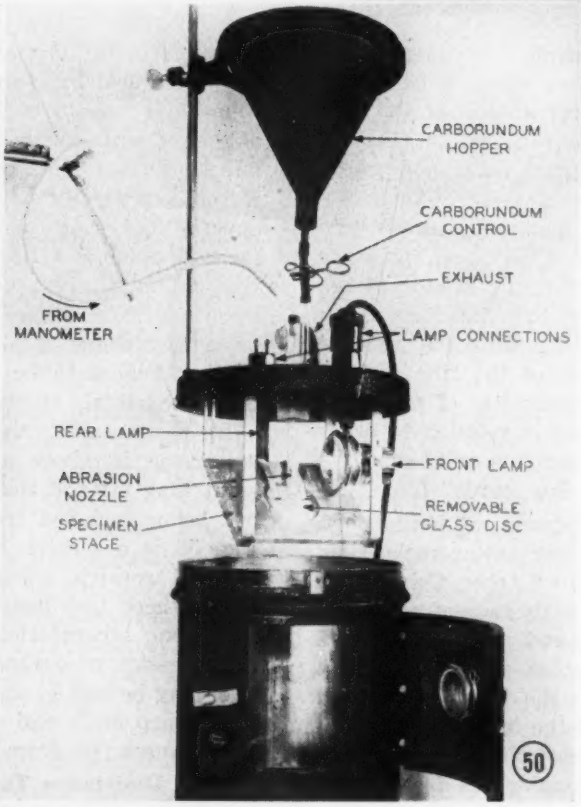




*Fig. 49 — Abrasiometer for determining abrasion resistance of organic coatings. Test panel is mounted in machine on a stage set at 45 degrees to the vertical tube of the nozzle. Nozzle is then brought down in contact with panel. In the test, film is worn away at a spot directly under exit end of nozzle by a controlled Carborundum blast*

*Fig. 50—Abrasion test apparatus open, showing details*

*Fig. 51 — Application of Taber Abraser for determining abrasion resistance of organic coatings*

Thus, if the material showing good abrasion resistance has adequate adherence and toughness, it may provide a satisfactory protective organic coating. In some instances a high abrasion resistance value may merely indicate an incomplete "cure".

The Taber Abraser, manufactured by the Taber Instrument Co., North Tonawanda, N. Y., gives an indication of the ability of a finish to withstand wear due to rubbing action. The wearing action is obtained from Dual Calibrase wheels of definite abrasive properties. These wheels are made to revolve in opposite directions by the rotation of the panel under the wheels. The resulting action is one comparable to normal rubbing wear as encountered under actual service conditions.

Test panels 4 inches square, with a hole in the center for mounting are used with the Taber Abraser in testing appliance finishes at the General Electric Bridgeport laboratories as shown in Fig. 51. Panels are weighed, run for 500 cycles, and reweighed, the procedure being repeated until the coating has been worn off to the base metal. To maintain the same abrasive properties of the Calibrase wheels, they are dressed off clean after each 500 wearing cycles. The abrasion resistance factor is determined under these conditions by averaging the weight loss and reporting it as milligrams loss per 1000 revolutions.

**Impact Resistance Test**—Impact tests on organic finishes, although necessarily of a somewhat arbitrary nature, serve a two fold purpose. They offer information on the relative resistance of various coatings to deformation in the form of sudden concentrated stresses, and also give an indication of the degree to which a coating adheres to its substrate. Effect of various surface preparations on initial adherence is clearly reflected, and changes in adherence, brought about by interfacial reactions at the metal substrate, are immediately revealed.

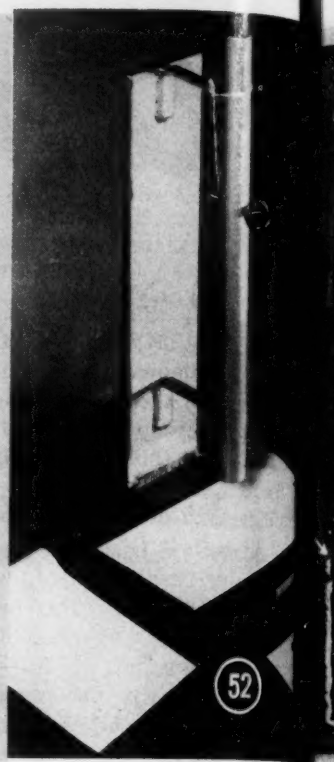
Tests for determining resistance of coatings to impact are usually based on falling balls or hammers. A valuable machine for this test, in use at the Bell Telephone Laboratories, is shown in Fig. 54. Fig. 53 shows a specimen tested for impact resistance by the Bell Telephone laboratories' impactometer. The arrow indicates the position on the impact pattern where the finish was first shattered. This also represents the minimum energy, in revolution per minute of the impact tool, necessary to disrupt the film. It has been pointed out[57] that impact resistance is greatly affected by the toughness or brittleness of the film and its adherence to the base metal. Character of failure of an impact test must be recorded in relation to other qualities. Usually impact resistance is quite sensitive to the changes in thickness of the "cured" film.

General Electric's test laboratories, at Bridgeport, Conn., use an instrument of their own construction, meeting the requirements of the Kitchen Cabinet Institute, for testing the impact resistance of appliance finishes. It consists of a 2-pound steel rod with a ½-inch diameter spherical contact end. This bar is allowed to fall 10 inches onto the test panel which has been placed at the base of the instrument, which consists of a heavy steel block with a ⅝-inch diameter hole centered directly under the free falling impact rod. Thus, the test panel is subjected to an impact of 20 inch pounds. The impact test instrument is illustrated in Fig. 52. According to the test standards for a kitchen cabinet finish, no chipping or flaking is allowed when either side of the panel is given the impact test. On other finishes, where outstanding heat or alkali resistance is of prime importance, some chipping is allowed.

*Fig. 52 — Impact test instrument used at General Electric test laboratories*

*Fig. 53 — Specimen tested for impact resistance by Bell Telephone laboratories' impactometer. Arrow indicates position on the impact pattern where finish was first shattered. This also represents minimum energy (in revolutions per minute of the impact tool) necessary to disrupt film*

*Fig. 54—Impact apparatus for testing organic coatings at Bell Telephone laboratories*




**Test for Adhesion** — While it is generally conceded that no satisfactory direct measurement for the adherence of an organic finish to the base metal has yet been devised, some tests have been used and found quite useful in throwing light upon the quality of this characteristic. However, the term "scratch-adhesion" more clearly defines the action of the test methods generally used than does the term "adherence." Most tests for adherence employ a scratching method which is applied to the coating in such a way that under a given condition of loading, the finish is just barely removed from the surface. The load, on a scratching or scraping member, at which the coating begins to be removed from the surface of the base metal, is given as the scratch-adhesion.

In some cases, the figure for scratch-adhesion resistance is given as the maximum load in the scratching method that the film can withstand without being removed from the base metal. Shown in Fig. 55 is a scratch adhesion tester and in Fig. 58 a hand scratch adhesion tester (calibrated thumb nail); these test instruments are in use at the Bell Telephone laboratories. Sometimes a rough idea of the adhesion of organic coatings to metal base products may be had by scratching the film with the point of a sharp knife and noting the ease with which the finish comes free from the base metal.

**Heat Resistance Test** — Heat resistance tests are

made on finishes used on metal products, and appliances, such as electric roasters, which will be required to withstand heat conditions during use. The standard heat tests used at the General Electric appliance test laboratory consist of placing a coated test panel in an oven at 300° F and allowing it to remain for 300 hours. The finish is checked periodically for dulling, discoloration, embrittlement, and loss of adhesion. It is reported that a satisfactory heat resistant finish should withstand the test, with only slight discoloration and loss of gloss, and very little loss of flexibility and adhesion.

**Electrographic Printing Pores in Protective Coatings**—It is generally recognized in the metal finishing industry that certain tests of protective coating may depend for their ultimate results on porosity of the coating. As a result there has been considerable interest in the use of the electrographic technique for the porosity evaluation of protective coatings, such as those represented by paint films. One method was recently described[62] for the determination of porosity in protective coatings by the use of a simplified electrographic instrumental procedure that permits the recording of porosity data of quantitative significance.

Essentially, the method involves anodic solution of the metal underlying the protective film, transmission of the cation through the pores of the film, and retention of the metal ions on a paper in contact with the

film and the cathode. Subsequent development of the paper in the proper reagents, results in the formation of a colored metal salt, permitting the determination of location and approximate size of the pores and cracks through which the metal ions have passed. For the work reported, the base metal used was iron; however, with the proper choice of developer any other structural metal may be used.

Equipment used in the tests consisted of a 20-ton Elmes press, a suitable current source equipped with suitable measuring devices and two sets of pressure platens. Fig. 56 shows the electrical setup. Fig. 57, is a detailed sectional view of the platens used to hold the test specimen.

**Test Procedure**—Procedure for carrying out the test on a coated metal panel is as follows: Blotting paper and imbibition paper are cut to the size desired for the final print; these pieces must be of the exact same size. The kind of paper used for the printing is important. Coarse or rough-grained paper was found not to give suitable clarity. Paper containing large quantities of sizing or coloring agents can cause unevenness in printing. As a result of a series of tests, Kodak's imbibition paper, double weight F, was found to be the most satisfactory paper for this use.

The papers, when cut, are soaked in 5 per cent solution of potassium nitrate for 30 minutes. Both blotting and print papers are removed from the soaking bath and, together, squeezed between two dry pieces of blotting paper which must overlap the soaked paper by ¾-inch on all sides. The pressure used should be approximately 550 pounds per square inch. The wider border of the dry papers will take up the excess solution squeezed out of the soaked papers.

Coated test panel is then laid on the anode platen, with the metal of the panel in contact with the metal of the anode; the imbibition papers are placed with emulsion side in contact with the area of which the desired porosity study is to be made. The soaked and squeezed blotting paper is laid congruently on the imbibition paper. The cathode platen is then placed over the blotting paper. This entire "sandwich" is centered in the press and the necessary pressure applied. The current is switched on as soon as the pressure required is obtained. After 20 seconds, the current is switched off and pressure immediately released.

The imbibition paper is placed in a developing bath made up of 25 grams per liter of potassium ferrocyanide and 25 grams per liter of potassium ferricyanide. Distilled water is used in the preparation of the developing solution, and generally 100 milliliters will be found to be a sufficient quantity for developing the test paper. Prints are left in this bath for 30 minutes, washed in warm water until the yellow color of the ferricyanide is removed, and then dried between blotting papers or on ferrotype tins. Length of time film and paper must be maintained under pressure, with an applied potential, was found to be an important factor. If too much time is allowed for the migration of the ions into the imbibition paper, under a definite voltage gradient, these ions may migrate laterally on the test sheet and exaggerate the indicated size of the pore. Further, sharpness as related to the true pore size, can suffer because of this migration.

**Application and Processing Properties of Organic Finishes**—It is the user's responsibility to maintain good control over application, processing, handling of the finished product and to provide satisfactory application of drying or baking equipment. There are, however, wide differences in the versatility of available finishing materials that affect the quality and economy of results. A good rule to follow is that all organic finishing materials should be sampled and tested when they are received from the supplier. If materials are not tested until the user is ready to

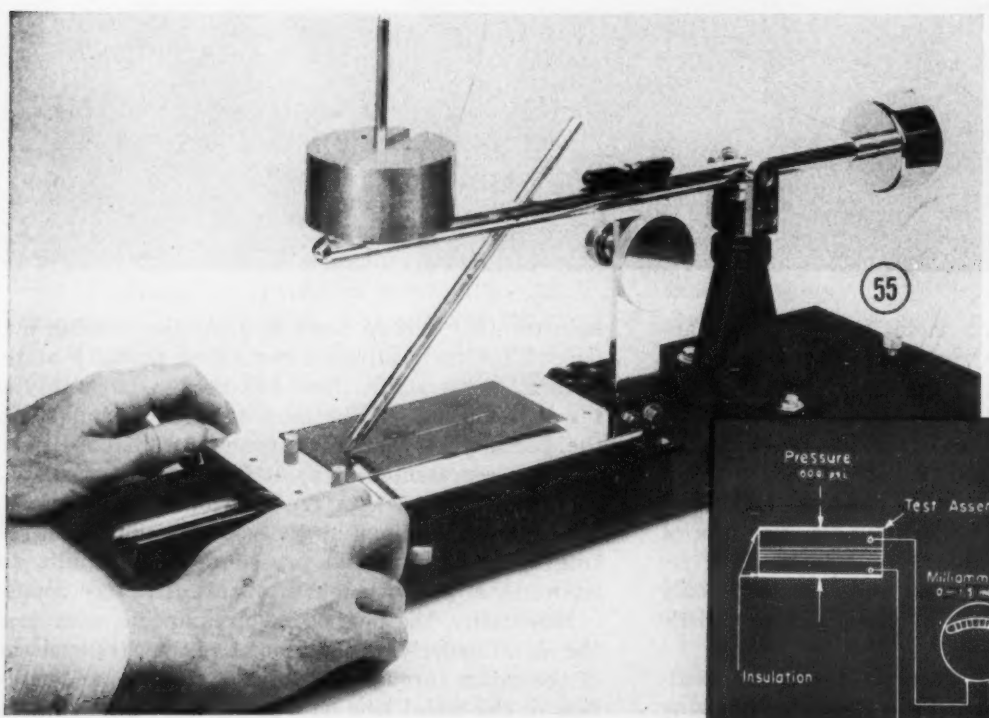



*Fig. 55—Scratch adhesion tester for use with organic finishes*

*Fig. 56 — Drawing showing complete assembly of test equipment for electrographic printing pores in organic coatings*

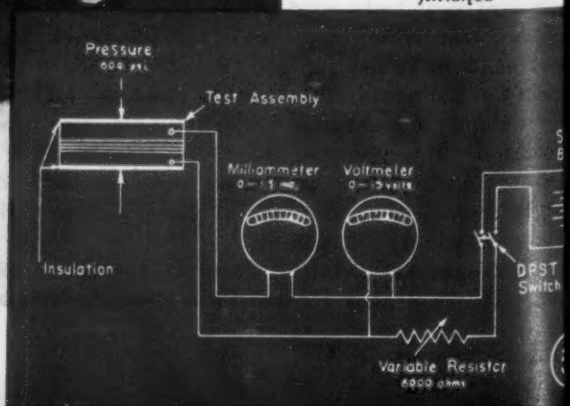



*Fig. 57—Detailed sectional view of platens used to hold specimen in electrographic printing pores in protective finishes*

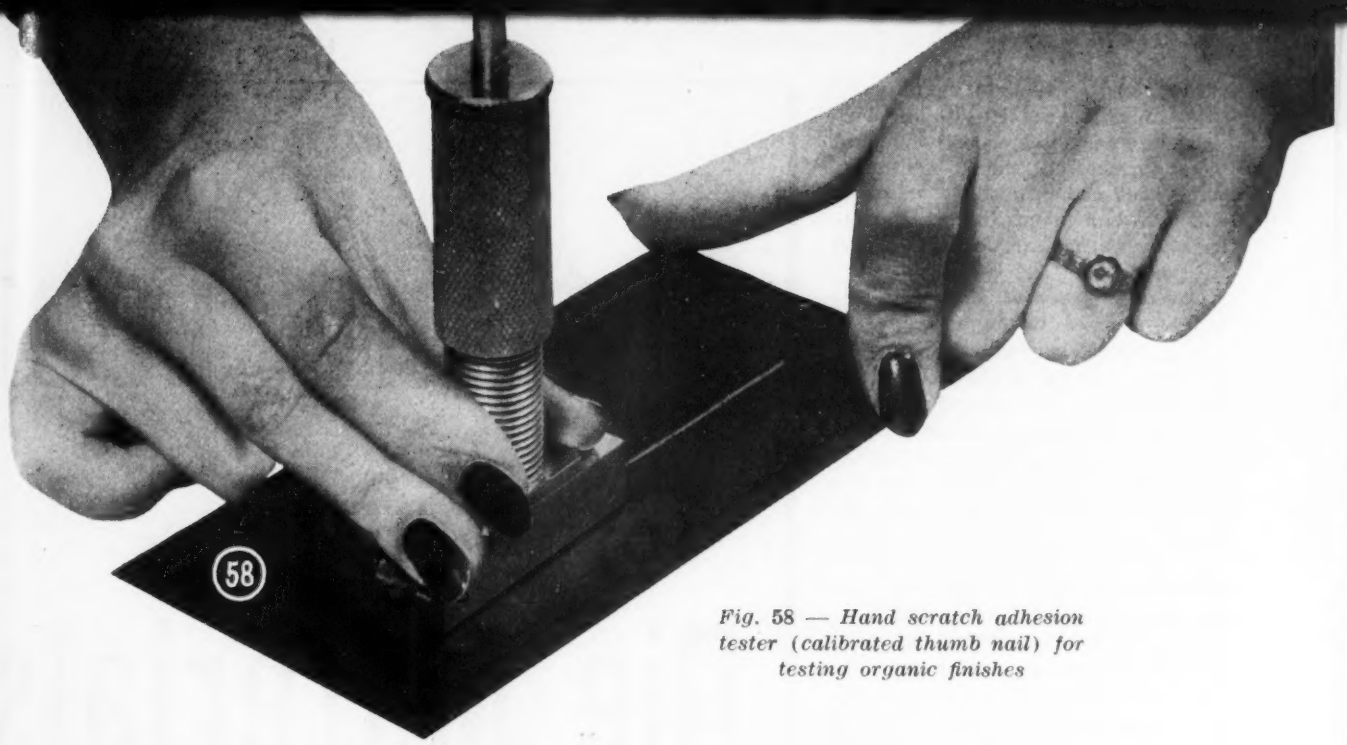


*Fig. 58 — Hand scratch adhesion tester (calibrated thumb nail) for testing organic finishes*

apply them, there is always the possibility that the finisher will find himself with only unsatisfactory materials on hand, causing unnecessary production delays.

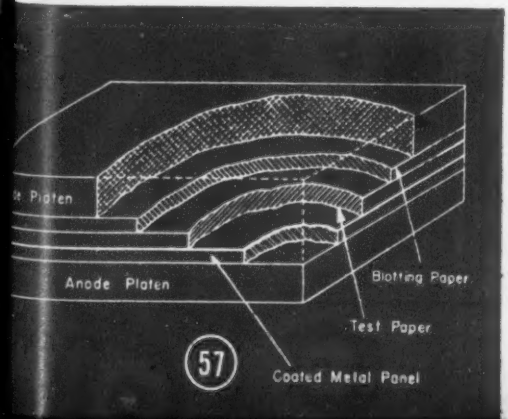
One definite advantage of testing materials before their use, other than the obvious reasons, is that the information obtained from the receiving tests is of assistance in diagnosing troubles in production which occur in every finishing department. With reasonable assurance that the finishing materials were received in satisfactory condition, immediate attention can be given to the things which may have gone wrong in the preparation of materials, application procedures, or baking schedules.

**Sampling**—Examination of a shipment of finishing material begins with taking a sample. The tester should thoroughly agitate the material before taking a sample; otherwise, the tests carried out have little meaning and can be misleading. Material in the container should be examined for settling, separation of tinting colors and ease with which it is stirred to a uniform consistency. A 1-pint container should be filled approximately two-thirds full with the finishing material, closed and set aside for examination after 2 months or a normal storage period, for settling, skinning, development of seediness, bodying or loss of gloss. Also, the following factors should be determined and recorded on the sample as received: 1. Weight per gallon; 2. gravity; 3. per cent solids; 4. viscosity and per cent reduction required to reduce to application viscosity. During reduction, the reaction should be noted when the thinner is added, and the finishing mixture should be examined after reduction for any evidence of graininess or seediness.

A convenient and satisfactory means of taking a sample from a drum is with a clean glass or metal tube ½-inch to ⅝-inch internal diameter and about 24 inches long.

**Application Properties** — The finishing material should be examined to see that it will spray easily, with good atomization after making adjustments of the spray gun, air pressure, fluid pressure, and, if necessary, the viscosity. Observations should be made on the ability of the finishing material to wet out spray dust, and the blending in of overspray with a previous application. In finishing operations on many metal products, the material is applied to an object on a moving conveyor in such a manner that one operator frequently covers only a part of the surface and the spraying operation is completed by one or more operators. Thus, in testing this characteristic of finishing materials, the experimental application setup should include drying intervals in line with actual production conditions. Also during application tests, the characteristics of the material for hiding power should be noted as well as the amount of spraying required to result in proper film thickness and appearance.

Hiding power of white and light colored finishes used on metal products is an important factor. There are a number of laboratory tests available for the evaluation of hiding power of organic coatings based on the total thickness required to obscure the line of demarcation between a white and black or a white and gray background. Also in application evaluation tests, observations should be made to see how well normal surface irregularities, such as light scratches from metal finishing abrasives are obscured. The one coat and two-coat synthetic finishes used on a



variety of present day metal products cannot be expected to fill deep scratches, nor obscure poorly finished metal surfaces. It should be remembered that some finishing materials will show a different color, or appearance over finished and unfinished steel surfaces.

**Coverage Tests of Finishing Materials**—An item having an important bearing on the over-all cost of the organic finish on the metal product, and one that, for the sake of economy, must not be neglected in metal finish testing is the square feet of surface each gallon of material will cover, at a satisfactory film thickness for durability and appearance. Many finishing room set-ups insist that organic finishing materials be purchased on the basis of square feet coverage per gallon, durability and freedom from processing troubles rather than the price per gallon. It sometimes happens that materials with what appears to be a low price, are more expensive than higher priced materials due to a lower coverage per gallon.

Theoretical coverage or spread of a material, that is, the square feet at unit thickness the finishing material will cover, provided none of the film building solids are lost during application, should be determined in the laboratory on all new finishing materials. It is valuable in comparing the possible spread of new materials and comparing production coverage results. To calculate the theoretical coverage of a finishing material per gallon, it is necessary to know the weight of film building solids per gallon and the density of the dried film.[6] To obtain sufficient data, the weight per gallon and the per cent solids is accurately determined. The finishing material is applied to weighed, smooth-surfaced panels, baked, again weighed, and the film thickness accurately determined. From the weight in pound per gallon, and the per cent solids, the pounds of film building solids can be calculated.

From the weight of the dried film on the panel of known area, and the determined film thickness, the weight of the solids material per cubic inch can be calculated. It will be found more accurate and convenient to determine the film weight in grams, and then divide by 454 to convert into pounds. The weight of solids per gallon, when divided by the weight in pounds per cubic inch, gives the volume of film building material. Thus, from the volume of solids, it is a simple conversion to square feet spread at any thickness that may be desired.

It has been pointed out that the

(*Please turn to Page* 112)

# Cutting Tool and Die Materials

SECOND OF A
SEVEN SECTION SERIES

**This information on cutting tool and die materials prepared by the editors of STEEL lists factors to be considered in the quick selection of tool steels and carbide types to meet any given requirement. Sources, trade names and applications are conveniently presented. Other pertinent data include chemical analyses, heat treatments, quenching media, movement in hardening and machinability as annealed**

| PRIMARY APPLICATION | TRADE NAME & TYPE | ANALYSIS (%) | SUGGESTED TEMPERATURE RANGES (°F) | | | | | | Quenching Medium. ★ % Machinability Annealed. Movement in Hardening. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Forging | Finish Forging | Annealing | Preheating | Hardening | Tempering | |
| **ATLAS STEELS LTD., East Main St., Welland, Ont., Canada** | | | | | | | | | **Listing No. 5** |
| Cold Work Dies (Blanking, Cold Forming) | ATLAS REFINED 10 Water Hardening | C 1.00, Mn .25, Si .20 | 1800–1900 | 1450–1500 | 1400–1450 | .... | 1425–1500 | 300–650 | Water Mach. 100 Movement —C |
| Cold Work Dies (Blanking, Cold Forming) | ATLAS X10 Water Hardening | C 1.05, Mn .20, Si .20 | 1800–1900 | 1450–1500 | 1400–1450 | .... | 1425–1500 | 300–600 | Water Mach. 100 Movement —C |
| Cold Work Dies (Blanking) | BADGER Oil Hardening | C 1.25, Mn .25, Cr .40, W 1.50, V .20, Si .25 | 1800–1900 | 1500–1600 | 1475–1525 | 1200–1300 | 1575–1650 | 300–500 | Oil Mach. 85 Movement +A |
| Cold Work Dies (Blanking, Cold Forming) | CRO-MO-LOY Air Hardening | C 1.00, Mn 1.00, Cr 5.00, Mo 1.00, V .25, Si .30 | 1900–2000 | 1600–1700 | 1525–1575 | 1200–1300 | 1725–1800 | 300–600 | Air Mach. 85 Movement +A |
| Cold Work Dies (Blanking, Cold Forming) | FNS Air Hardening | C 1.50, Mn .30, Cr 12.00, Mo .80, V .25, Si .30 | 1900–2000 | 1600–1700 | 1600–1650 | 1200–1300 | 1825–1900 | 300–600 | Air Mach. 45 Movement +A |
| Cold Work Dies (Blanking, Cold Forming) | KEEWATIN Oil Hardening | C .90, Mn 1.15, Cr .50, W .50, Si .30 | 1800–1900 | 1500–1600 | 1400–1450 | 1200–1300 | 1425–1500 | 300–650 | Oil Mach. 90 Movement +A |
| Cold Work Dies (Blanking, Cold Forming) | NN Oil Hardening | C 2.25, Mn .30, Cr 12.50, V .25, Si .25 | 1900–2000 | 1600–1700 | 1600–1650 | 1200–1300 | 1725–1800 | 300–650 | Oil Mach. 40 Movement +A |
| Cold Work Dies (Cold Forming) | ATLAS SPEC. ALLOY 10 Water Hardening | C 1.05, Mn .20, V .20, Si .20 | 1800–1900 | 1450–1550 | 1400–1450 | .... | 1425–1500 | 300–400 | Water Mach. 100 Movement —C |
| Cold Work Dies (Cold Forming) | ATLAS XXX Water Hardening | C 1.35, Mn .30, Cr .35, W 3.75, Si .30 | 1800–1900 | 1500–1600 | 1435–1485 | .... | 1525–1600 | 300–400 | Water Mach. 75 Movement —C |
| Cold Work Dies (Cold Forming) | ATLAS XX95 Water Hardening | C .95, Mn .30, Si .30 | 1800–1900 | 1450–1550 | 1400–1450 | .... | 1450–1525 | 300–500 | Water Mach. 100 Movement —C |
| Cold Work Dies (Cold Forming) | ATLAS X12 Water Hardening | C 1.20, Mn .25, Si .20 | 1800–1900 | 1450–1550 | 1400–1450 | .... | 1425–1500 | 300–400 | Water Mach. 100 Movement —C |
| Cutting Tools (Finishing) | ATLAS "Q" Water Hardening | C 1.20, Mn .25, Cr .50, Si .20 | 1800–1900 | 1450–1550 | 1400–1450 | .... | 1435–1510 | 300–400 | Water Mach. 95 Movement —C |
| Cutting Tools (Finishing) | DENINE Water Hardening | C 1.25, Mn .25, W 1.40, Si .25 | 1800–1900 | 1500–1600 | 1425–1475 | .... | 1475–1550 | 300–400 | Water Mach. 90 Movement —C |
| Cutting Tools (Finishing) | TROJAN High Speed | C .80, Mn .25, Cr 4.00, W 18.50, Mo .50, V 2.00, Si .30 | 2000–2100 | 1600–1700 | 1600–1650 | 1500–1600 | 2300–2375 | 1000–1050 | Oil, Air Mach. 45 Movement +A |
| Cutting Tools (Finishing) | (See ATLAS X12, BADGER, XXX, Listed Above) | | | | | | | | |
| Cutting Tools (Roughing) | MOHICAN High Speed | C .80, Mn .25, Cr 4.00, W 1.50, Mo 9.00, V 1.20, Si .30 | 1900–2000 | 1600–1700 | 1550–1600 | 1500–1600 | 2160–2240 | 1000–1050 | Oil, Air Mach. 55 Movement +A |
| Cutting Tools (Roughing) | NIPIGON High Speed | C .78, Mn .25, Cr 4.00, W 19.00, Mo .80, V 2.00, Co 8.00, Si .30 | 2000–2100 | 1600–1750 | 1600–1650 | 1500–1600 | 2300–2425 | 1000–1050 | Oil, Air Mach. 45 Movement +A |
| Cutting Tools (Roughing) | POWHATAN High Speed | C .75, Mn .25, Cr 4.00, W 19.00, V 1.25, Co 5.00, Si .30 | 2000–2100 | 1650–1750 | 1600–1650 | 1500–1600 | 2325–2400 | 1000–1050 | Oil, Air Mach. 45 Movement +A |
| Cutting Tools (Roughing) | SIXIX High Speed | C .82, Mn .25, Cr 4.00, W 6.50, Mo 5.00, V 2.00, Si .30 | 1900–2000 | 1600–1700 | 1550–1600 | 1500–1600 | 2200–2275 | 1000–1050 | Oil, Air Mach. 55 Movement +A |
| Cutting Tools (Roughing) | SPARTAN 7 High Speed | C .72, Mn .25, Cr 4.00, W 18.00, V 1.20, Si .30 | 2000–2100 | 1600–1700 | 1600–1650 | 1500–1600 | 2275–2350 | 1000–1050 | Oil, Air Mach. 50 Movement +A |
| Die Casting Dies | ATLAS DIE Casting Steel Oil Hardening | C .40, Mn .75, Cr .60, Mo .15, Si .20, Ni 1.25 | 2100–2200 | 1600–1700 | 1525–1575 | .... | 1500–1575 | 400–1300 | Oil Mach. 100 Movement B |
| Die Casting Dies | CRODI Air Hardening | C .35, Mn .40, Cr 5.00, Mo 1.50, V .40, Si 1.00 | 1900–2000 | 1550–1650 | 1550–1600 | 1300–1400 | 1775–1875 | 800–1200 | Air Mach. 75 Movement A |
| Die Casting Dies | RED INDIAN Air Hardening | C .35, Mn .30, Cr 5.00, W 4.00, Mo .30, V .30, Co .50, Si 1.00 | 1900–2000 | 1550–1650 | 1550–1600 | 1300–1400 | 1775–1875 | 800–1250 | Air Mach. 75 Movement A |
| Die Casting Dies | SENECA Oil, Air Hardening | C .35, Mn .30, Cr 3.25, W 10.00, V .40, Si .30 | 1950–2050 | 1550–1650 | 1550–1600 | 1450–1550 | 2050–2250 | 900–1200 | Oil, Air Mach. 70 Movement +A |
| Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing) | SPARTAN 5 Oil, Air Hardening | C .50, Mn .30, Cr 4.00, W 18.00, V 1.00, Si .30 | 2000–2100 | 1600–1700 | 1600–1650 | 1500–1600 | 2100–2300 | 950–1200 | Oil, Air Mach. 55 Movement +A |
| Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing) | ULTIMO 6 Oil, Air Hardening | C .55, Mn .55, Cr .75, Mo .75, Si .25, Ni 1.60 | 1900–2000 | 1550–1650 | 1400–1450 | 1200–1300 | 1450–1525 | 400–1100 | Oil Mach. 75 Movement A |
| Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing) | (See CRODI, RED INDIAN, SENECA, Listed Above) | | | | | | | | |
| Plastic Molding Dies (Ejector Pins) | FALCON 6 Oil Hardening | C .55, Mn .25, Cr 1.50, W 2.00, V .25, Si .30 | 1900–2000 | 1500–1600 | 1475–1525 | .... | 1600–1675 | 300–800 | Oil Mach. 80 Movement +B |
| Plastic Molding Dies (Ejector Pins) | MONARK 2 Water Hardening | C .60, Mn .75, Cr .30, Mo .20, Si 2.00 | 1900–2000 | 1500–1600 | 1450–1500 | .... | 1575–1650 | 300–800 | Oil Mach. 80 Movement —B |
| Plastic Molding Dies (Ejector Pins) | ATLAS X12 (Listed Above) Water Hardening | | | | | | | | |

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.

| PRIMARY APPLICATION | TRADE NAME & TYPE | ANALYSIS (%) | SUGGESTED TEMPERATURE RANGES (°F) | | | | | | Quenching Medium. ★ % Machinability Annealed. Movement in Hardening. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Forging | Finish Forging | Annealing | Preheating | Hardening | Tempering | |
| Plastic Molding Dies (Hubs) | (See CRO-MO-LOY, FALCON 6, FNS, KEEWATIN, MONARK 2, NN, Listed Above) | | | | | | | | |
| Plastic Molding Dies (Hubbed Cavity Dies) | ATLAS HOBBING IRON<br>Water Hardening | C .05, Mn .20, Si .15 | 2100–2200 | 1600–1700 | 1525–1575 | .... | 1425–1475 | 300–500 | Water<br>Movement —B |
| Plastic Molding Dies (Hubbed Cavity Dies) | IMPACTO<br>Water Hardening | C .16, Mn .50, Mo .25, Si .20, Ni 1.75 | 2100–2200 | 1600–1700 | 1525–1575 | .... | 1450–1500 | 200–500 | Oil<br>Movement —B |
| Plastic Molding Dies (Machine Cut Cavities) | SUPRIMPACTO<br>Oil Hardening | C .12, Mn .50, Cr 1.50, Si .20, Ni 3.75 | 2100–2200 | 1600–1700 | 1525–1575 | .... | 1450–1500 | 200–500 | Oil Mach. 100<br>Movement —B |
| Plastic Molding Dies (Mach. Cut Cavities) | (See CRO-MO-LOY, KEEWATIN Listed Above) | | | | | | | | |
| Punching and Shearing | ATLAS REFINED 8<br>Water Hardening | C .80, Mn .25, Si .20 | 1800–1900 | 1450–1500 | 1400–1450 | .... | 1425–1500 | 300–800 | Water Mach. 100<br>Movement —C |
| Punching and Shearing | FALCON 4<br>Oil Hardening | C .45, Mn .25, Cr 1.50, W 2.00, V .25, Si .30 | 1900–2000 | 1500–1600 | 1475–1525 | .... | 1600–1675 | 300–700 | Oil Mach. 80<br>Movement +B |
| Punching and Shearing | (See ATLAS XXX, ATLAS X10, FALCON 6, FNS, MONARK 2, NN, ULTIMO 6, Listed Above) | | | | | | | | |
| Shock Resisting (Intermittent Impact) | ATLAS ALPHA 8<br>Water Hardening | C .80, Mn .25, Si .20, Cr-W-Mo-V higher than normal residuals | 1800–1900 | 1450–1500 | 1400–1450 | .... | 1425–1500 | 300–700 | Water Mach. 100<br>Movement —C |
| Shock Resisting (Intermittent Impact) | MAPLE LEAF<br>Water Hardening | C .80, Mn .30, Si .25, Cr-W-Mo-V higher than normal residuals | 1800–1900 | 1450–1500 | 1400–1450 | .... | 1425–1500 | 300–700 | Water Mach. 100<br>Movement —C |
| Shock Resisting (Repeated Impact) | ATLAS SPECIAL ALLOY 8<br>Water Hardening | C .80, Mn .20, V .20, Si .20 | 1800–1900 | 1450–1500 | 1400–1450 | .... | 1425–1500 | 300–700 | Water Mach. 100<br>Movement —C |
| Shock Resisting (Repeated Impact) | (See ATLAS REFINED 8, FALCON 4, FALCON 6, MONARK 2, Listed Above) | | | | | | | | |

## BETHLEHEM STEEL CO., 701 East Third St., Bethlehem, Pa. — Listing No. 6

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Cold Work Dies (Blanking, Cold Forming) | A-H5<br>Air Hardening | C 1.00, Mn .60, Cr 5.25, Mo 1.10, V .25 | 2000–2050 | 1700 .... | 1650 .... | 1200 .... | 1750–1800 | 350–400 | Air Mach. 65<br>Movement +A |
| Cold Work Dies (Blanking, Cold Forming) | BA-H<br>Air Hardening | C 1.00, Mn 2.00, Cr 2.20, Mo 1.10 | 1950–2000 | 1500 .... | 1425 .... | 1200 .... | 1550–1600 | 325–400 | Air Mach. 60<br>Movement +A |
| Cold Work Dies (Blanking, Cold Forming) | BEST<br>Water Hardening | C .80-1.10, V .20 | 1800–1950 | 1500 .... | 1375–1425 | 1200 .... | 1425–1475 | 300–650 | Water Mach. 95<br>Movement +C |
| Cold Work Dies (Blanking, Cold Forming) | BETHALLOY<br>Oil Hardening | C .75, Mn .75, Cr .90, Mo .35, Ni 1.75 | 1950–2000 | 1700 .... | 1400–1450 | 1200 .... | 1500–1550 | 300–500 | Oil Mach. 85<br>Movement +B |
| Cold Work Dies (Blanking, Cold Forming) | BTR<br>Oil Hardening | C .90, Mn 1.20, Cr .50, W .50, V .20 | 1850–1950 | 1500 .... | 1375–1425 | 1200 .... | 1450–1500 | 325–400 | Oil Mach. 90<br>Movement +B |
| Cold Work Dies (Blanking, Cold Forming) | LEHIGH-H<br>Air Hardening | C 1.55, Cr 11.50, Mo .80, V .40 | 1900–1950 | 1700 .... | 1650 .... | 1300 .... | 1850 .... | 400–925 | Air Mach. 45<br>Movement ±A |
| Cold Work Dies (Blanking, Cold Forming) | LEHIGH-L<br>Air, Oil Hardening | C .85, Cr 11.50, Mo .45, V .30, Ni 1.00 | 1900–1950 | 1700 .... | 1650 .... | 1300 .... | 1850 .... | 400–900 | Oil Mach. 50<br>Movement ±A |
| Cold Work Dies (Blanking, Cold Forming) | LEHIGH-S<br>Oil Hardening | C 2.05, Cr 11.50, V .60 | 1900–1950 | 1700 .... | 1650 .... | 1300 .... | 1800–1850 | 400–925 | Oil Mach. 40<br>Movement ±A |
| Cold Work Dies (Blanking, Cold Forming) | SUPERIOR<br>Water Hardening | C .90-1.30, V .20 | 1800–1950 | 1500 .... | 1375–1425 | 1200 .... | 1400–1450 | 300–650 | Water Mach. 95<br>Movement +C |
| Cold Work Dies (Blanking, Cold Forming) | X<br>Water Hardening | C .70-1.10 | 1800–1925 | 1500 .... | 1400–1450 | 1200 .... | 1425–1475 | 300–650 | Water Mach. 100<br>Movement +C |
| Cold Work Dies (Blanking, Cold Forming) | XX<br>Water Hardening | C .90-1.30 | 1800–1925 | 1500 .... | 1375–1425 | 1200 .... | 1400–1450 | 300–650 | Water Mach. 100<br>Movement +C |
| Cold Work Dies (Blanking, Cold Forming) | XXX<br>Water Hardening | C .90-1.35 | 1800–1925 | 1500 .... | 1375–1425 | 1200 .... | 1400–1450 | 300–650 | Water Mach. 100<br>Movement +C |
| Cold Work Dies (Blanking, Cold Forming) | XCL<br>Water Hardening | C .80-1.20 | 1800–1925 | 1500 .... | 1375–1425 | 1200 .... | 1425–1475 | 300–650 | Water Mach. 100<br>Movement +C |
| Cold Work Dies (Cold Forming) | BFS<br>Water Hardening | C 1.30, W 4.00 | 1750–1850 | 1500 .... | 1450 .... | 1200 .... | 1475–1525 | 250–350 | Water Mach. 70<br>Movement +C |
| Cutting Tools (Finishing) | HM HIGH SPEED<br>High Speed | C .78, Cr 3.85, W 1.60, Mo 8.50, V 1.05 | 1900–1950 | 1800 .... | 1550 .... | 1550 .... | 2200–2240 | 1000–1050 | Oil, Air Mach. 65<br>Movement +B |
| Cutting Tools (Finishing) | 67 TAP<br>Oil Hardening | C .25, Cr .65, W 1.40, V .20 | 1750–1850 | 1500 .... | 1425–1475 | 1200 .... | 1525–1575 | 325–600 | Oil Mach. 70<br>Movement +C |
| Cutting Tools (Finishing) | BFS | (Listed Above) | | | | | | | |
| Cutting Tools (Roughing) | BETH. HOLLOW DRILL<br>Water, Oil Hardening | C .75, Mn .20, Si .15 | 1800–1950 | 1650 .... | 1425 .... | 1200 .... | 1550 .... | ... | Oil, Water Mach. 100<br>Movement +C |
| Cutting Tools (Roughing) | COMOKUT<br>High Speed | C .73, Cr 4.50, W 18.25, V 1.25, Co 5.00 | 2050–2150 | 1800 .... | 1625–1675 | 1600 .... | 2250–2400 | 1000–1050 | Oil, Air Mach. 55<br>Movement +A |

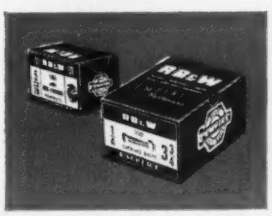
# *Our New Packages*

## CUT YOUR FASTENING COSTS 3 WAYS

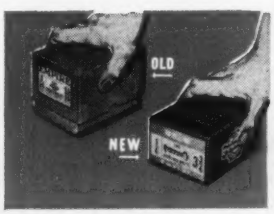
RB&W's consistent effort to help you keep fastening costs low, is typified by the new, attractive package developed for RB&W bolts, nuts, screws and rivets.

Your first glimpse of the package shows the label information to be clear and complete. Big black type on a white background and the product pictured on the label save your men time and error in selecting from stock.

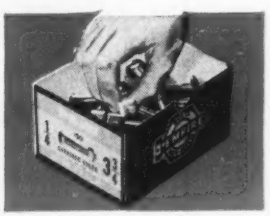
This box is designed to give maximum opening for accessibility of contents. It is labelled upside down purposely to prevent bottom dropping out while handling . . . it ends all problems of dropping and spilling.



**QUICK IDENTIFICATION.** Picture of contents plus clarity and completeness of label information make selection quick and accurate.




**FUMBLE-PROOF COVER.** Boxes are designed with covers *underneath*. No danger of box slipping from under cover, spilling contents.



**STURDIER, MORE CONVENIENT BOX.** Brightwood construction, sturdy as metal-edged. No flaps. Opens on flat side, won't tip.

And closer examination shows the construction strong, yet light—abuse resistant, convenient to handle.

Already, the new RB&W package has been called the most sensible—and most attractive—in the fastener industry.

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

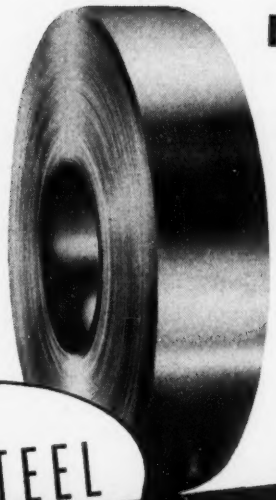
**RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY**

*103 Years Making Strong the Things That Make America Strong*

| PRIMARY APPLICATION | TRADE NAME & TYPE | ANALYSIS (%) | SUGGESTED TEMPERATURE RANGES (°F) | | | | | | Quenching Medium. ★ % Machinability Annealed. Movement in Hardening. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Forging | Finish Forging | Annealing | Preheating | Hardening | Tempering | |
| **BISSETT STEEL CO., 945 E. 67th ST., Cleveland 8, Ohio** | | | | | | | | | **Listing No. 7A** |
| Cold Work Dies (Blanking, Cold Forming) | BISCO TOOL STEEL TUBING Oil Hardening | C 1.00, Mn 1.00, Cr 1.50, Mo .20 | 1750–1900 | 1600–1650 | 1350–1450 | 1150–1250 | 1500–1600 | 325–900 | Oil |
| Cold Work Dies | AIRPRO Air Hardening | C 1.00, Mn .60, Cr 5.25, Mo 1.10, V .25 Si .20 | 1900–2000 | 1700–1750 | 1550–1600 | | 1750–1800 | 250–950 | Air |
| Cold Work Dies | OILTEMP Oil Hardening | C .90, Mn 1.10, Cr .50, W .50, V .20 | 1700–1850 | 1500–1550 | 1440–1460 | 1100–1200 | 1450–1525 | 325–500 | Oil |
| Cutting Tools (Finishing) | CARBON Water Hardening | C As Desired, Mn .25, Si .20 | 3 grades: | | Special, Extra and Standard | | | | Brine |
| Cutting Tools (Finishing) | CARVAN Water Hardening | C As Desired, Mn .25, V .25, Si .20 | 3 grades: | | Special, Extra and Standard | | | | Brine |
| Cutting Tools (Finishing) | TIGER VAN High Speed | C .80, Cr 4.25, W 18.50, Mo .50, V 2.10 | 1950–2150 | 1700–1750 | 1600–1650 | 1500–1600 | 2325–2400 | 950–1100 | Oil |
| Cutting Tools | BISMO M-2 High Speed | C .82, Cr 4.00, W 6.50, Mo 5.00, V 1.90 | 1900–2050 | 1600–1700 | 1450–1550 | 1350–1550 | 2175–2275 | 950–1100 | Oil |
| Cutting Tools | BISMO M-3 High Speed | C 1.00, Cr 4.00, W 6.25, Mo 6.25, V 2.40 | 1900–2050 | 1600–1700 | 1450–1550 | 1350–1500 | 2150–2250 | 950–1100 | Oil |
| Cutting Tools | BISMO 8-4-1 High Speed | C As Desired, Cr 4.00, W 1.50, Mo 8.50, V 1.15 | 1900–2025 | 1600–1700 | 1450–1550 | 1350–1500 | 2150–2250 | 950–1100 | Oil |
| Cutting Tools | SUPER TIGER High Speed | C .80, Cr 4.50, W 18.50, Mo .80, V 1.75, Co 7.50 | 2000–2150 | 1750–1800 | 1600–1650 | 1450–1600 | 2325–2375 | 1000–1150 | Oil |
| Cutting Tools | TIGER BRAND High Speed | C As Desired, Cr 4.00, W 18.00, V 1.10 | 1950–2150 | 1700–1750 | 1600–1650 | 1450–1600 | 2325–2375 | 950–1100 | Oil |
| Cutting Tools | TIGER SPECIAL High Speed | C .75, Cr 4.25, W 18.00, Mo .50, V 1.10, Co 5.00 | 2050–2200 | 1750–1800 | 1600–1650 | 1450–1600 | 2350–2400 | 950–1150 | Oil |
| Die Casting (Aluminum) | GRIPMORE NO. 1 Air Hardening | C .35, Mn .35, Cr 5.00, Mo 1.00, V .40, Si 1.00 | 1900–2000 | 1550–1650 | 1450–1500 | | 1800–1825 | 900–1200 | Air |
| Hot Work Dies | CHECKNO NO. 1 Oil Hardening | C .45, Mn .25, Cr 3.50, W 13.25, Si .20 | 1900–2000 | 1600–1650 | 1550–1600 | 1500–1550 | 2000–2150 | 950–1300 | Oil |
| Hot Work Dies | CHECKNO NO. 2 Oil Hardening | C .35, Mn .25, Cr 3.50, W 11.00, V .45, Si .20 | 1850–1950 | 1600–1650 | 1500–1550 | 1500–1550 | 2050–2150 | 950–1300 | Oil |
| Hot Work Dies | CHECKNO NO. 3 Oil Hardening | C .28, Mn .30, Cr 3.25, W 8.50, V .30 Si .30 | 1850–1950 | 1600–1650 | 1500–1550 | 1500–1550 | 2050–2150 | 950–1300 | Oil |
| Hot Work Dies | CROMVA Water, Oil Hardening | C .35 or .50, Mn .60, Cr 1.00, V .20 | 1700–1900 | 1550–1600 | 1380–1425 | | Water 1500 Oil 1600 | 300–1200 | Water, Oil |
| Hot Work Dies | HYPRO A Oil, Air Hardening | C .35, Mn .60, Cr 7.50, W 7.50, Si 1.50 | 2000–2100 | 1650–1700 | 1600–1650 | 1500–1550 | 2050–2150 | 600–1300 | Oil |
| Hot Work Dies | HYPRO B Air Hardening | C .35, Mn .25, Cr 5.25, W 5.25, Mo .20, V .20, Co .50, Si .90 | 1800–2000 | 1650–1700 | 1550–1600 | | 1825–1950 | 950–1250 | Air |
| Hot Work Dies | WOCO Oil, Air Hardening | C .45, Cr 1.50, W 2.25, V .25 | 1800–2000 | 1500–1600 | 1425–1475 | 1150–1250 | Oil 1750 Air 1800 | Cold 300-500 Hot 750-1250 | Oil |
| Hot Work Dies | GRIPMORE NO. 2 Air Hardening | C .35, Mn .35, Cr 5.00, W 1.35, Mo 1.75, Si 1.00 | 1900–2000 | 1550–1650 | 1450–1500 | | 1800–1825 | 900–1200 | Air |
| Punching, Shearing | ANNITE NO. 1 Oil Hardening | C 2.25, Mn .30, Cr 13.00, V .20, Si .25 | 1750–1900 | 1650–1700 | 1600–1650 | 1100–1200 | 1700–1800 | 400–1000 | Oil |
| Punching, Shearing | ANNITE NO. 2 Air Hardening | C 1.50, Mn .30, Cr 11.50, Mo .80, V .25, Si .25 | 1800–1900 | 1600–1650 | 1600–1650 | 1100–1200 | 1800–1850 | 400–1000 | Air |
| Shock Resisting | CROMO Oil Hardening | C .55, Mn .50, Cr 1.00, Mo .35 | 1750–1900 | 1500–1600 | 1400–1450 | 1100–1200 | 1500–1600 | 300–750 | Oil |
| Shock Resisting | SILIMO Water, Oil Hardening | C .50, Mn .45, Mo .50, V .20, Si 1.10 | 1700–1900 | 1550–1650 | 1450–1500 | 1600 | Water 1600 Oil 1650 | 300–500 | Water, Oil |
| Shock Resisting | SILICARB Water, Oil Hardening | C .55, Mn .75, Mo .20, Si 2.00 | 1700–1900 | 1550–1650 | 1450–1500 | 1600 | Water 1600 Oil 1650 | 300–500 | Water, Oil |
| Shock Resisting | (See CROMVA, WOCO, Listed Above).... | | | | | | | | |

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.

# HOW CMP THINSTEEL IMPROVES PROFIT PICTURES



**Cold rolled strip steel users who work with CMP Thinsteel frequently find their over-all production costs lower than when employing competitive products.**

**There's good reason. Thinsteel offers characteristics that are reflected in sharp reductions in fabricating costs and product improvement that enhances sales appeal.**

**Check these Thinsteel features and judge for yourself how Thinsteel can help to improve your profit picture.**

CMP THINSTEEL

| CHARACTERISTIC | WHAT IT MEANS TO YOU |
|---|---|
| WIDE RANGE OF ANALYSES IN CARBON, ALLOY AND STAINLESS GRADES | The analysis best suited to your end product requirement can be developed and produced to meet the particular fabricating problems involved. |
| CLOSE GAUGE TOLERANCES | More parts per ton. An average oversize variation of .002" on .030" strip means 6⅔% fewer parts per ton. |
| GAUGES THIN AS .001" | Lighter gauges with properly developed physical properties can often be used to replace heavier gauges, reducing weight without sacrificing strength or utility. |
| FINISHES FROM DULL TO MIRROR-BRIGHT OR ELECTRO-ZINC COATED | You have your choice of regular cold rolled for ordinary purposes, mirror-bright for plating and mirror-bright stainless or electro-zinc coated carbon steel for corrosion resistance. |
| EXTRA-LONG COILS | Fewer shutdowns for coil replacement on coil-fed machines. Greater per-day production. |

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.

CMP PRECISION COLD ROLLED STRIP STEEL

**the Cold Metal Products co.**

YOUNGSTOWN 1, OHIO

| PRIMARY APPLICATION | TRADE NAME & TYPE | ANALYSIS (%) | SUGGESTED TEMPERATURE RANGES (°F) | | | | | | Quenching Medium. ★ % Machinability Annealed. Movement in Hardening. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Forging | Finish Forging | Annealing | Preheating | Hardening | Tempering | |
| Cutting Tools (Roughing, Finishing) | RED TIGER High Speed | C 1.00, Cr 4.50, W 18.50, V 2.65 | 2000–2050 | 1700 .... | 1600–1650 | 1600 .... | 2300–2350 | 1000–1050 | Oil, Air Mach. 50 Movement +B |
| Cutting Tools (Roughing, Finishing) | SPECIAL HS High Speed | C .73, Cr 4.00, W 18.00, V 1.05 | 2050–2150 | 1750 .... | 1650 .... | 1600 .... | 2300–2400 | 1000–1050 | Oil, Air Mach. 60 Movement +B |
| Cutting Tools (Roughing, Finishing) | 66 H-S High Speed | C .83, Cr 4.15, W 6.35, Mo 5.00, V 1.90 | 2050–2100 | 1800 .... | 1580–1625 | 1550 .... | 2250–2275 | 1000–1025 | Oil, Air Mach. 65 Movement +A |
| Die Casting Dies | CR-MO-V Oil, Air Hardening | C .33, Cr 5.25, Mo 1.15, V .45, Si 1.10 | 2050–2150 | 1650 .... | 1575–1600 | 1350 .... | 1825–1850 | 1050–1150 | Oil, Air Mach. 70 Movement +A |
| Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing) | CR MO W Oil, Air Hardening | C .35, Cr 5.00, W 1.55, Mo 1.65, Si 1.05 | 2050–2150 | 1650 .... | 1575–1600 | 1350 .... | 1850 .... | 1050–1150 | Oil, Air Mach. 70 Movement +B |
| Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing) | HOT WORK-8 (HW-8) Oil, Air Hardening | C .60, Cr 3.60, Mo 8.50, V 1.75 | 2000–2100 | 1600 .... | 1600 .... | 1600 .... | 2150–2200 | 1120–1280 | Oil, Air Mach. 65 Movement +B |
| Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing) | THERMODIE HW Oil Hardening | C .60, Mn .50, Cr 1.05, Mo .90, Ni 1.50 | 2050–2150 | 1750 .... | 1375–1425 | 1200 .... | 1500–1550 | 900–1150 | Oil Mach. 70 Movement +B |
| Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing) | 57 HOT WORK Oil, Air Hardening | C .35, Cr 2.75, W 9.00, V .30 | 1950–2000 | 1700 .... | 1550–1600 | 1500 .... | 2100–2200 | 1000–1250 | Oil, Air Mach. 65 Movement +A |
| Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing) | 57 SPEC. HW Oil, Air Hardening | C .40, Cr 3.50, W 14.00, V .30 | 1950–2000 | 1700 .... | 1550–1600 | 1500 .... | 2150–2250 | 1100–1250 | Oil, Air Mach. 60 Movement +B |
| Hot Work Dies (Hot Forming, Hot Punching, Hot Shearing) | CR-MO-V (Listed Above) | | | | | | | | |
| Plastic Molding Dies (Master Hubs) | 67 CHISEL Water, Oil Hardening | C .50, Cr 1.15, W 2.50, V .20, Si .75 | 2000–2100 | 1650 .... | 1450–1500 | 1200 .... | 1700–1750 | 300–500 | Oil, Water Mach. 75 Movement ±A |
| Plastic Molding Dies (Hubbed Cavity Dies) | HOBBING DIE STEEL (Low C) Water, Oil Hardening | C .06, Mn .15, Si .10 | 2500 .... | 2000 .... | 1700 .... | 1200 .... | 1400–1550 | 250–350 | Oil, Water Mach. 80 Movement +C |
| Plastic Molding Dies (Hubbed Cavity Dies) | NI CR HOBBING Oil Hardening | C .09, Mn .50, Cr .55, Si .10, Ni 1.25 | 2500 .... | 2000 .... | 1700 .... | 1200 .... | 1400–1550 | 250–350 | Oil Mach. 80 Movement +B |
| Plastic Molding Dies (Master Hubs) | A-H5 (Listed Above) | | | | | | | | |
| Plastic Molding Dies (Machine Cut Cavity Dies, Master Hubs) | (See BA-H, BETHALLOY, BTR, A-H5, Listed Above) | | | | | | | | |
| Punching & Shearing | OMEGA Water, Oil Hardening | C .60, Mn .70, Mo .45, V .20, Si 1.85 | 1850–1950 | 1650 .... | 1425–1475 | 1200 .... | 1550–1650 | 400–650 | Oil, Water Mach. 65 Movement +B |
| Punching & Shearing | TOUGH H Water Hardening | C .70, Mn .30, Cr .95, V .20 | 1950–2000 | 1700 .... | 1550–1600 | 1200 .... | 1475–1500 | 400–500 | Water Mach. 75 Movement +C |
| Punching & Shearing | TOUGH M Oil Hardening | C .45, Mn .55, Cr .95, V .20 | 2000–2050 | 1600 .... | 1400–1450 | 1200 .... | 1650–1700 | 350–450 | Oil Mach. 80 Movement +B |
| Punching & Shearing | (See BEST, BETHALLOY, BTR, LEHIGH-H, LEHIGH-L, LEHIGH-S, X, XX, XXX, XCL, SUPERIOR, 67 CHISEL, 71 ALLOY, Listed Above) | | | | | | | | |
| Shock Resisting (Repeated Impact) | PISTON Water Hardening | C 1.15, Cr .55, V .20 | 1850–1900 | 1500 .... | 1375–1425 | 1200 .... | 1425–1475 | 300–500 | Water Mach. 80 Movement +C |
| Shock Resisting (Intermittent Impact) | (See A-H5, BETHALLOY, BA-H, BTR, Listed Above) | | | | | | | | |
| Shock Resisting (Repeated and Intermittent Impact) | (See BEST, OMEGA, SUPERIOR, TOUGH H, TOUGH M, X, XX, XXX, XCL, 67 CHISEL, 71 ALLOY, Listed Above) | | | | | | | | |

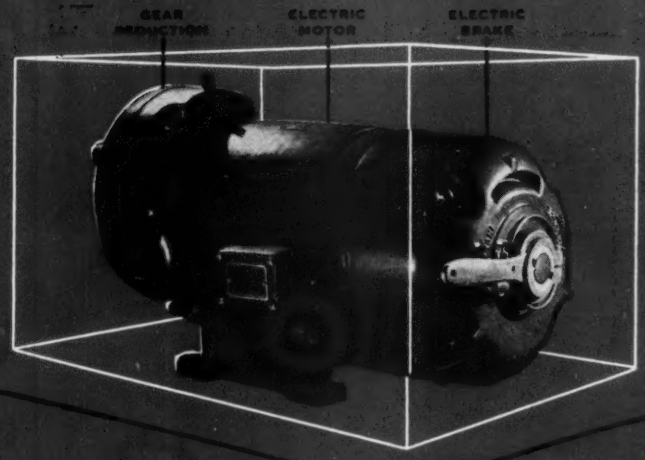
## H. BOKER & CO. INC., 101 Duane St., New York 7, N. Y. — Listing No. 7

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Blanking and Forming Dies | KINITE (Air Hardening) In Rolled, Bars and Casting form. | C 1.52, Mn .54, Cr 13.74, Mo. .98, V .60, Co .57, Si .47, Ni .16 | 1700–2000 | .... .... | 1650 .... | 1200–1400 | 1825–1875 | 1000 .... | Air (High Speed) Movement A |
| Cutting Tools | NOVO SUPERIOR High Speed | C .72, Mn .24, Cr 4.14, W 18.36, V 1.08, Si .27 | .... .... | 950–2050 | 1650 .... | 1550–1600 | 2250–2350 | 1020–1080 | Oil (High Speed) Movement A |
| Dies | OILWAY Oil Hardening | C .94, Mn 1.23, Cr .44, W .57 | 1750–1800 | .... .... | 1425–1450 | 1200–1250 | 1475–1500 | 350–400 | Oil See (*) Movement A |
| Plastic Molding Dies | KINITE (Listed Above) | | | | | | | | |

* Same as carbon water hardening steel.

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.


Don't put up with make-shift assemblies when it is so easy to get the RIGHT horsepower, the RIGHT shaft speed, the RIGHT construction features, the RIGHT mounting . . . all combined into one compact, easy to use power package.

## All in one package

Master Gearmotors, available in millions on millions of combinations of types and ratings, permit you to use a power drive on each job that's just right . . . a power drive that will add greatly to the compactness, appearance, and economy of each of your applications.

Use Master Gearmotors to increase the salability of your motor-driven products . . . improve the economy and productivity of your plant equipment. They're the horsesense way to use horsepower.

**THE MASTER ELECTRIC COMPANY**
**DAYTON 1, OHIO**

MASTER GEARMOTORS

| PRIMARY APPLICATION | TRADE NAME & TYPE | ANALYSIS (%) | SUGGESTED TEMPERATURE RANGES (°F) | | | | | | Quenching Medium. ★ % Machinability Annealed. Movement in Hardening. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Forging | Finish Forging | Annealing | Preheating | Hardening | Tempering | |
| **BOYD-WAGNER, 1440 West Lake St., Chicago, Ill.** | | | | | | | | | **Listing No. 8** |
| Cold Work Dies (Cold Forming) | No. 4 COLD HEADER<br>Water Hardening | C 1.00, Mn .30, Si .20 | .... | .... | .... | .... | 1400–1450 | 350 .... | Water<br>Movement B |
| Cutting Tools | RECORD EMINENT<br>Oil Hardening, High Speed | C .75, Mn .30, Cr 5.00, W 18.50, V 1.50, Co 8.50, Si .20 | .... | .... | .... | 1250 | 2280–2375 | 1065 1200 | Oil, Air<br>Movement A |
| Cutting Tools | RECORD SUPERIOR<br>Oil Hardening, High Speed | C .70, Mn .30, Cr 4.00, W 18.00, V 1.00, Co .30, Si .20 | .... | .... | .... | 1250 | 2200–2390 | 1050–1150 | Oil, Air<br>Movement A |
| Cutting Tools | RECORD 66<br>Oil Hardening, High Speed | C .80, Mn .30, Cr 4.50, W 5.50, Mo 4.50, V 1.50, Si .20 | .... | .... | .... | 1250 | 2175–2225 | 1000–1050 | Oil<br>Movement A |
| Cutting Tools (Roughing) | RECORD STAR<br>Oil Hardening, High Speed | C .70, Mn .35, Cr 4.00, W 14.00, V 2.00, Si .20 | .... | .... | .... | 1250 | 2250–2350 | 1050–1100 | Oil, Air<br>Movement A |
| Dies and Tools | ARROW OIL HARDENING<br>Oil Hardening | C .95, Mn 1.20, Cr .50, W .50, V .10, Si .20 | .... | .... | .... | 1100 | 1440–1500 | 350–375 | Oil<br>Movement A |
| Dies and Tools | BEST W. H.<br>Water Hardening | C .95, Mn .30, Si .20 | .... | .... | .... | .... | 1400–1450 | 350–570 | Water<br>Movement B |
| Dies and Tools | BOWCO NON-SHRINK<br>Oil Hardening | C .90, Mn 1.20, Cr .50, W .50, Si .35 | .... | .... | .... | .... | 1440–1500 | 350 .... | Oil<br>Movement A |
| Dies and Tools | BOWCO 7720<br>Oil Hardening | C 1.20, Mn .55, Cr 1.65, Mo .45, Si .30 | .... | .... | .... | .... | 1550–1575 | 300–400 | Oil<br>Movement B |
| Dies and Tools | FORMALOY<br>Oil Hardening | C .75, Mn .30, Cr 1.00, Mo .20, Si .25, Ni 1.75 | .... | .... | .... | 1100 | 1475–1525 | 300 .... | Oil<br>Movement B |
| Dies and Tools | HYPRO 61 HCHC<br>Air Hardening, High Speed | C 1.50, Mn .25, Cr 11.50, Mo .80, V .85, Co .40, Si .40 | .... | .... | .... | 1200 | 1780–1850 | 350–950 | Air<br>Movement A |
| Dies and Tools | HYPRO 62 HCHC<br>Oil Hardening, High Speed | C 2.00, Mn .60, Cr 12.00, Si .40 | .... | .... | .... | 1200 | 1740–1810 | 250 650 | Oil<br>Movement A |
| Dies and Tools | HYPRO 63 HCHC<br>Air Hardening, High Speed | C 1.70, Mn .20, Cr 18.00 | .... | .... | .... | 1200 | 1800–1900 | 300–650 | Oil, Air<br>Movement A |
| Fast Finish | CROWN W<br>Water Hardening | C 1.30, Mn .30, Cr 1.80, W 4.00, V .20, Si .20 | .... | .... | .... | 1200 | 1510–1560 | 250 .... | Water<br>Movement A |
| Hot Work Dies (Forming) | EZ14W<br>High Speed | C .45, Mn .30, Cr 3.00, W 14.00, V .30, Si .20 | .... | .... | .... | 1200 | 2000–2300 | 1000–1250 | Oil, Air<br>Movement A |
| Hot Work Dies (Punching, Shearing) | EZ9W<br>High Speed | C .40, Mn .30, Cr 3.00, W 9.00, V .20, Si .20 | .... | .... | .... | 1200 | 2000–2275 | 1000–1250 | Oil, Air<br>Movement A |
| Jewelers Dies | VERY BEST W.H.<br>Water Hardening | C 1.05, Mn .30, Cr .50, V .10, Si .20 | .... | .... | .... | 1100 | 1400–1450 | 350–570 | Water<br>Movement B |
| Punching and Shearing | DUREDGE<br>Water, Oil Hardening | C .55, Mn .75, Mo .35, Si 2.00 | .... | .... | .... | .... | 1550–1625 | 300–350 | Water<br>Movement A |
| Shock Resisting | SPECIAL 18<br>Oil, Air Hardening | C .45, Mn .30, Cr 1.40, W 2.20, Mo .30, V .20, Si 1.00 | .... | .... | .... | 1000 | 1610–1910 | 350– .... | Water, Air, Oil<br>Movement A |
| Tools | STANDARD<br>Water Hardening | C 1.10, Mn .30, Si .20 | .... | .... | .... | .... | 1400–1450 | 350 550 | Water<br>Movement B |
| **BRAEBURN ALLOY STEEL CORP., Braeburn, Pa.** | | | | | | | | | **Listing No. 9** |
| Cold Work Dies (Blanking, Cold Forming) | AIRQUE<br>Air Hardening | C 1.00, Mn .70, Cr 5.25, Mo 1.15, V .25, Si .30 | 1900 .... | 1700 .... | 1550 .... | 1200 .... | 1790 .... | 350–1000 | Air<br>Movement A |
| Cold Work Dies (Blanking, Cold Forming) | EXTRA<br>Water Hardening | C 1.00, Mn .25, Si .25 | 1900 .... | 1500 .... | 1400 .... | .... .... | 1450 .... | 350–500 | Water<br>Movement C |
| Cold Work Dies (Blanking, Cold Forming) | KISKI<br>Oil Hardening | C .95, Mn 1.10, Cr .50, W .60, V .20, Si .30 | 1800 .... | 1600 .... | 1450 .... | 1200 .... | 1490 .... | 350–500 | Oil<br>Movement A |
| Cold Work Dies (Blanking, Cold Forming) | SPECIAL<br>Water Hardening | C 1.00, Mn .25, V .20, Si .25 | 1900 .... | 1500 .... | 1400 .... | .... .... | 1450 .... | 350–500 | Water<br>Movement C |
| Cold Work Dies (Blanking, Cold Forming) | SUPERIOR 1<br>Oil Hardening | C 2.15, Mn .50, Cr 12.50, V .60, Si .30 | 1950 .... | 1700 .... | 1600 .... | 1200 .... | 1800 .... | 350–1050 | Oil<br>Movement A |
| Cold Work Dies (Blanking, Cold Forming) | SUPERIOR 3<br>Oil, Air Hardening | C 1.50, Mn .30, Cr 12.00, Mo .80, V .80, Si .30 | 1950 .... | 1700 .... | 1600 .... | 1200 .... | 1850 .... | 350–1050 | Oil<br>Movement A |
| Cutting Tools (Roughing) | BONDED CARBIDE<br>High Speed | C .70, Mn .25, Cr 4.50, W 18.50, Mo .70, V 1.50, Co 12.00, Si .25 | 2050 .... | 1800 .... | 1650 .... | 1500 .... | 2360 .... | 1050 .... | Oil<br>Movement B |
| Cutting Tools (Roughing) | BONDED CARBIDE Jr.<br>High Speed | C .77, Mn .25, Cr 4.25, W 18.50, Mo .75, V 1.95, Co 7.60, Si .25 | 2050 .... | 1800 .... | 1650 .... | 1500 .... | 2360 .... | 1050 .... | Oil<br>Movement B |
| Cutting Tools (Roughing) | BRAECAST<br>Cast Alloy | | | | | | | | |

| PRIMARY APPLICATION | TRADE NAME & TYPE | ANALYSIS (%) | SUGGESTED TEMPERATURE RANGES (°F) | | | | | | Quenching Medium. ★ % Machinability Annealed. Movement in Hardening |
|---|---|---|---|---|---|---|---|---|---|
| | | | Forging | Finish Forging | Annealing | Preheating | Hardening | Tempering | |
| Cutting Tools (Roughing) | BONDED CARBIDE High Speed | C .70, Mn .25, Cr 4.50, W 18.50, Mo .70, V 1.50, Co 12.00, Si .25 | 2050 .... | 1800 .... | 1650 .... | 1500 .... | 2360 .... | 1050 .... | Oil Movement A |
| Cutting Tools (Roughing) | BONDED CARBIDE Jr. High Speed | C .77, Mn .25, Cr 4.25, W 18.50, Mo .75, V 1.95, Co 7.60, Si .25 | 2050 .... | 1800 .... | 1650 .... | 1500 .... | 2360 .... | 1050 .... | Oil Movement B |
| Cutting Tools (Roughing) | BRAECAST Cast Alloy | | .... | .... | .... | .... | .... | .... | Movement B |



| PRIMARY APPLICATION | TRADE NAME & TYPE | ANALYSIS (%) | SUGGESTED TEMPERATURE RANGES (°F) | | | | | | Quenching Medium. ★ % Machinability Annealed. Movement in Hardening |
|---|---|---|---|---|---|---|---|---|---|
| | | | Forging | Finish Forging | Annealing | Preheating | Hardening | Tempering | |
| Cutting Tools (Roughing) | COBALT High Speed | C .74, Mn .25, Cr 4.00, W 18.00, Mo .50, V 1.00, Co 5.00, Si .25 | 2050 .... | 1800 .... | 1650 .... | 1500 .... | 2360 .... | 1050 .... | Oil Movement B |
| Cutting Tools (Roughing) | COMO High Speed | C .77, Mn .25, Cr 4.00, W 1.55, Mo 8.50, V 1.20, Co 5.00, Si .25 | 1950 .... | 1800 .... | 1600 .... | 1450 .... | 2225 .... | 1050 .... | Oil Movement B |
| Cutting Tools (Roughing, Finishing) | BRAEMOW High Speed | C .82, Mn .25, Cr 4.20, W 6.50, Mo 5.00, V 1.90, Si .25 | 1900 .... | 1800 .... | 1600 .... | 1450 .... | 2220 .... | 1050 .... | Oil Movement B |
| Cutting Tools (Roughing, Finishing) | CONGO High Speed | C .78, Mn .25, Cr 4.00, W 4.00, Mo 5.00, V 1.40, Co 12.00, Si .25 | 1900 .... | 1800 .... | 1600 .... | 1450 .... | 2180 .... | 1050 .... | Oil Movement B |
| Cutting Tools (Roughing, Finishing) | MOCUT High Speed | C .80, Mn .25, Cr 4.00, W 1.55, Mo 8.00, V 1.10, Si .25 | 1900 .... | 1800 .... | 1550 .... | 1450 .... | 2200 .... | 1050 .... | Oil Movement B |
| Cutting Tools (Roughing, Finishing) | TWINVAN High Speed | C .82, Mn .25, Cr 4.25, W 18.50, Mo .65, V 2.10, Si .25 | 2050 .... | 1800 .... | 1650 .... | 1500 .... | 2350 .... | 1050 .... | Oil Movement B |
| Cutting Tools (Roughing, Finishing) | VINCO High Speed | C .70, Mn .25, Cr 4.00, W 18.00, V 1.00, Si .25 | 2050 .... | 1800 .... | 1650 .... | 1500 .... | 2350 .... | 1050 .... | Oil Movement B |
| Die Casting Dies (Aluminum) | PRESSURDIE 3 Air Hardening | C .39, Mn .30, Cr 5.50, Mo 1.10, V 1.00, Si 1.00 | 1950 .... | 1700 .... | 1650 .... | 1200 .... | 1850 .... | 1050–1100 | Air Movement A |
| Hot Work Dies (Punching, Forming) | PRESSURDIE 1 Air Hardening | C .38, Mn .30, Cr 5.00, W 5.00, Mo .25, V .20, Co .50, Si .90 | 1950 .... | 1700 .... | 1650 .... | 1200 .... | 1825 .... | 1050–1200 | Air Movement A |
| Hot Work Dies (Punching, Forming) | T-ALLOY Oil, Air Hardening | C .35, Mn .25, Cr 3.50, W 10.50, V .40, Si .25 | 2000 .... | 1750 .... | 1650 .... | 1500 .... | 2150 .... | 1050–1300 | Oil Movement B |
| Hot Work Dies (Punching, Forming) | T-ALLOY "A" Oil, Air Hardening | C .33, Mn .25, Cr 3.50, W 9.60, V .50, Si .25 | 2000 .... | 1750 .... | 1650 .... | 1500 .... | 2150 .... | 1050–1300 | Oil Movement B |
| Hot Work Dies (Punching, Forming) | T-ALLOY "B" Oil, Air Hardening | C .50, Mn .25, Cr 3.00, W 15.00, V .50, Si .25 | 2000 .... | 1750 .... | 1650 .... | 1500 .... | 2200 .... | 1050–1300 | Oil Movement B |
| Hot Work Dies (Punching, Forming) | T-ALLOY "C" Oil, Air Hardening | C .25, Mn .25, Cr 4.00, W 15.00, V .50, Si .25 | 2000 .... | 1750 .... | 1650 .... | 1500 .... | 2200 .... | 1050–1300 | Oil Movement B |
| Machined Plastic Molding, Extrusion Dies | PRESSURDIE 2 Air Hardening | C .35, Mn .35, Cr 5.00, W 1.20, Mo 1.45, V .35, Si 1.00 | 1950 .... | 1700 .... | 1650 .... | 1200 .... | 1825 .... | 1000–1200 | Air Movement A |
| Shock Resisting | TRITON Water Hardening | C .50, Mn .35, Mo .60, Si 1.00 | 1900 .... | 1750 .... | 1450 .... | .... .... | 1550 .... | 350–600 | Water Movement B |
| Shock Resisting | VIBRO Oil Hardening | C .50, Mn .25, Cr 1.40, W 1.90, V .25, Si .25 | 1900 .... | 1750 .... | 1450 .... | .... .... | 1750 .... | 350–600 | Oil Movement B |

## COLONIAL STEEL DIVISION, See Vanadium-Alloys Steel Co. (Listing No. 47)

## CRUCIBLE ELECTRIC STEEL CO., 123 E. 7th Ave., Homestead, Pa. — Listing No. 10

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Shock Resisting | CESCO SPECIAL Water, Oil, Air Hardening | C .55, Mn 1.00, Mo .40, V .35, Si 2.00 | 1850–1900 | 1700 .... | 1550 .... | .... .... | 1650–1600 | 400–1100 | Water, Oil, Air Mach. 50 Movement C |
| Shock Resisting | SUPER CESCO Water, Oil, Air Hardening | C .55, Mn 1.00, Mo 1.30, V .35, Si 2.00 | 1850–1900 | 1700 .... | 1600 .... | .... .... | 1650–1600 | 400–1175 | Water, Oil, Air Mach. 50 Movement C |

## CARBOLOY CO. INC., 11147 E. Eight Mile Rd., Detroit 32, Mich. — Listing No. 11

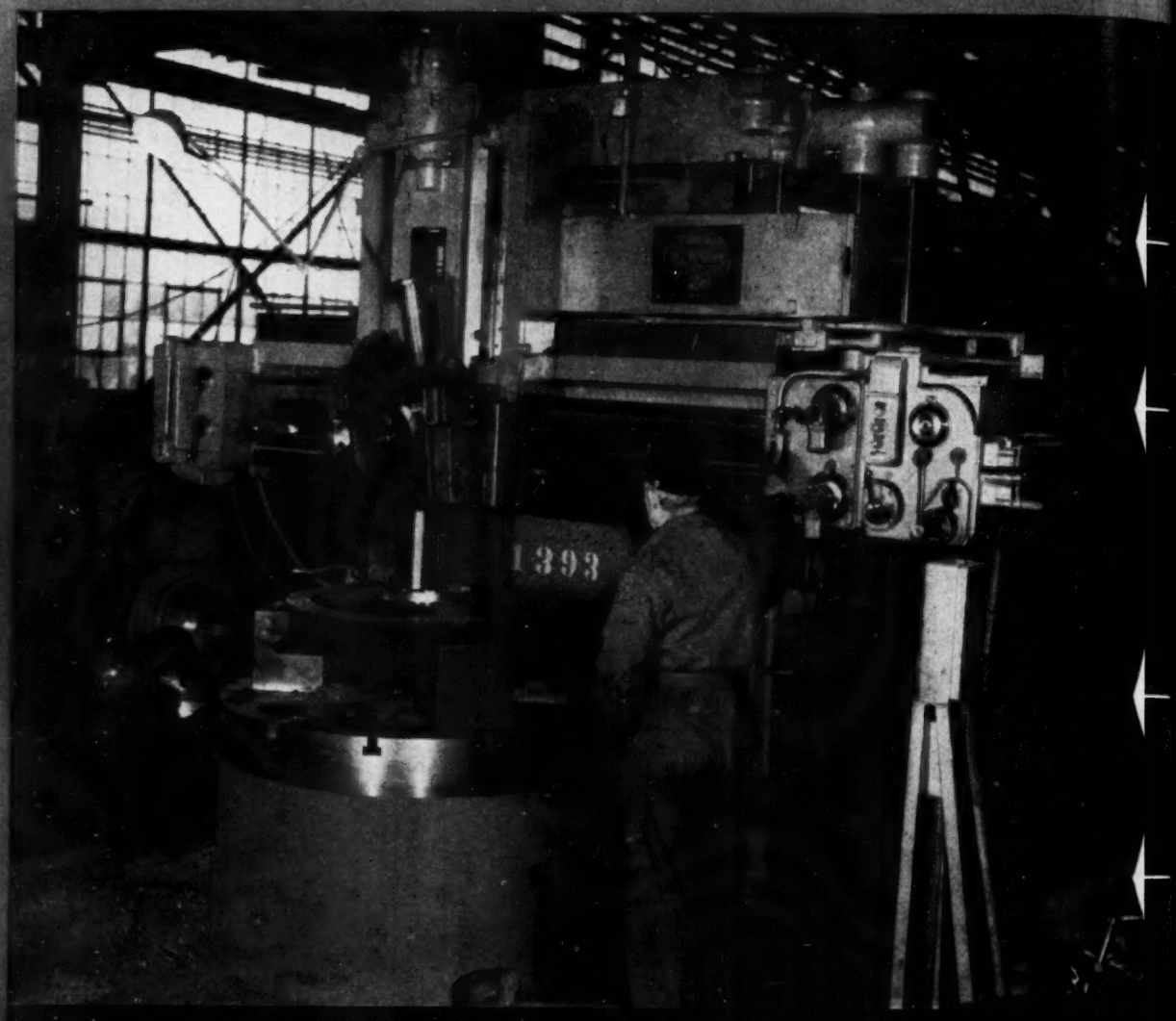
| | |
|---|---|
| Aluminum, Magnesium, Fine Grain Iron | 907, Carbide |
| Aluminum, Magnesium, Fine Grain Iron | 999, Carbide |
| Cold Work Dies (Cold Forming, Wire, Sheet, Tube Drawing, Cold Extrusion) | 55A, Carbide |
| Cold Work Dies, Large (Cold Forming) | 55B, Carbide |
| Cold Work Dies (Heading) | 190, Carbide |
| Cold Work Dies (Mandrels) | 958, Carbide |
| Cutting Tools (Finishing, Cast Iron, Nonferrous) | 999, Carbide |
| Cutting Tools (Finishing) | 907, Carbide |
| Cutting Tools (Finishing, Steel) | 831, Carbide |
| Cutting Tools (Hot Flash) | 77B, Carbide |

| *Application and Trade Name* | |
|---|---|
| Cutting Tools (Roughing) | 55A, Carbide |
| Cutting Tools (Roughing, Cast Iron, Nonferrous) | 779, Carbide |
| Cutting Tools (Roughing, Steel) | 78B, Carbide |
| Cutting Tools (Roughing, Steel) | 78C, Carbide |
| Cutting Tools (Roughing, Finishing, Cast Iron, Nonferrous) | 44A, Carbide |
| Cutting Tools (Roughing, Finishing, Steel) | 78, Carbide |
| Cutting Tools (Roughing, Finishing, Cast Iron, Nonferrous) | 883, Carbide |

| *Application and Trade Name* | |
|---|---|
| Cutting Tools (Roughing, Finishing, Cast Iron, Nonferrous) | 905, Carbide |
| Gages | 958, Carbide |
| Machine Parts, Gages | 883, Carbide |
| Machine Parts, Wear Parts, Gages | 44A, Carbide |
| Blanking & Punches | 55B, Carbide |
| Shock Resisting (Repeated, Intermittent Impact) | 55A, Carbide |
| Wire Drawing Dies | 779, Carbide |
| Wire Drawing Dies (Small Sizes, Steel Wire) | 999, Carbide |

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.

# BULLARD MAN-AU-TROL V. T. L. AUTOMATICALLY MACHINES DIESEL WHEELS 3 TIMES FASTER



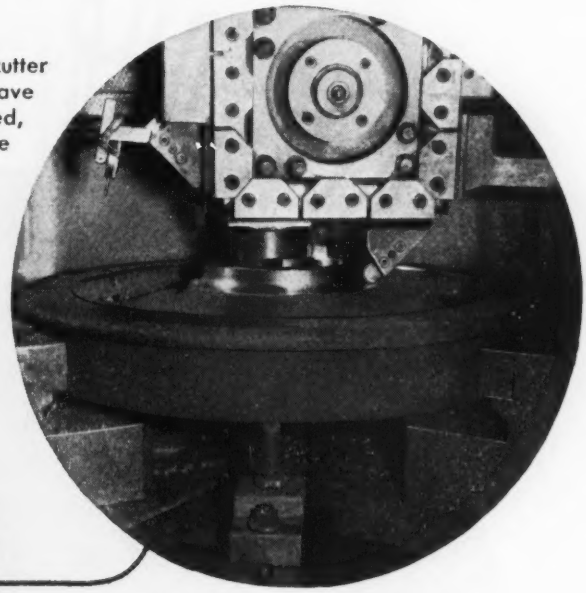

This BULLARD 54" Man-Au-Trol V. T. L. in the B. and M. R. R. shops at North Billerica, Mass., machines a wrought steel Diesel locomotive wheel in less than an hour, three times faster than the previous method. Man-Au-Trol Cuts Time between Cuts and Time on Cuts.

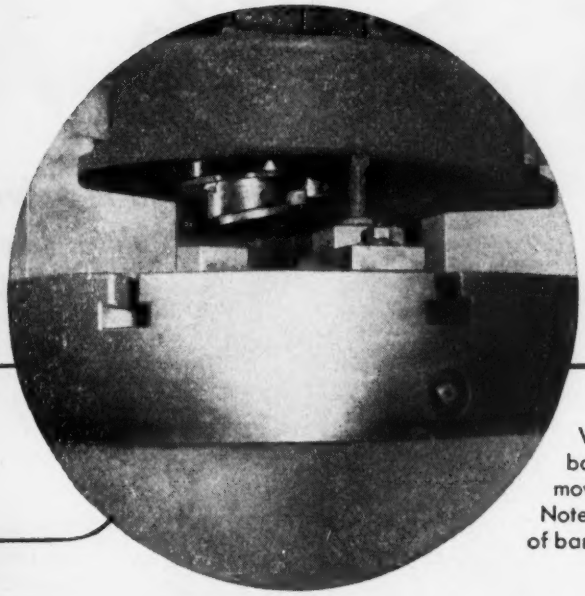
Your investigation of BULLARD Man-Au-Trol for your work will convince you that its combination of versatility, accuracy, productivity and cost-cutting ability is hard to beat. Write for Bulletin MAV-G-1, THE BULLARD COMPANY, Bridgeport 2, Conn.

BULLARD
MAN-AU-TROL
MASTER OF THE MACHINE

**BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE**

Here the boring tool and turning cutter on B. and M.'s Man-Au-Trol V. T. L. have nearly finished their cuts. When finished, the head moves to the right to straddle face the hub.

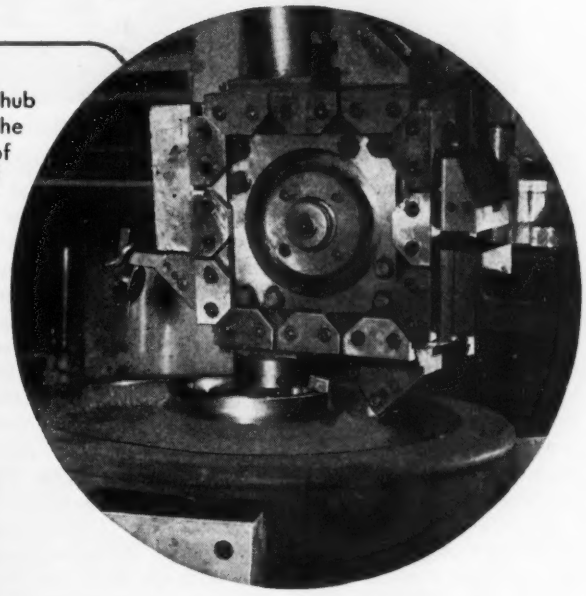


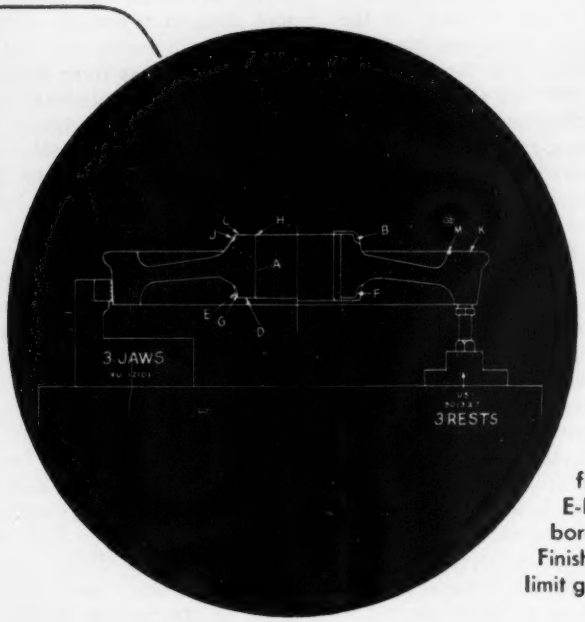


View from underside of wheel showing boring tool at end of cut, ready to move to the right to take straddle cut. Note lower straddle cutter on right side of bar.

# How Diesel Locomotive Wheels Are Machined On 54" BULLARD MAN-AU-TROL V. T. L.

Here you see the finish of the hub straddle facing operation. Now the head and bar move left to center of bore and rise to index position for next operation.

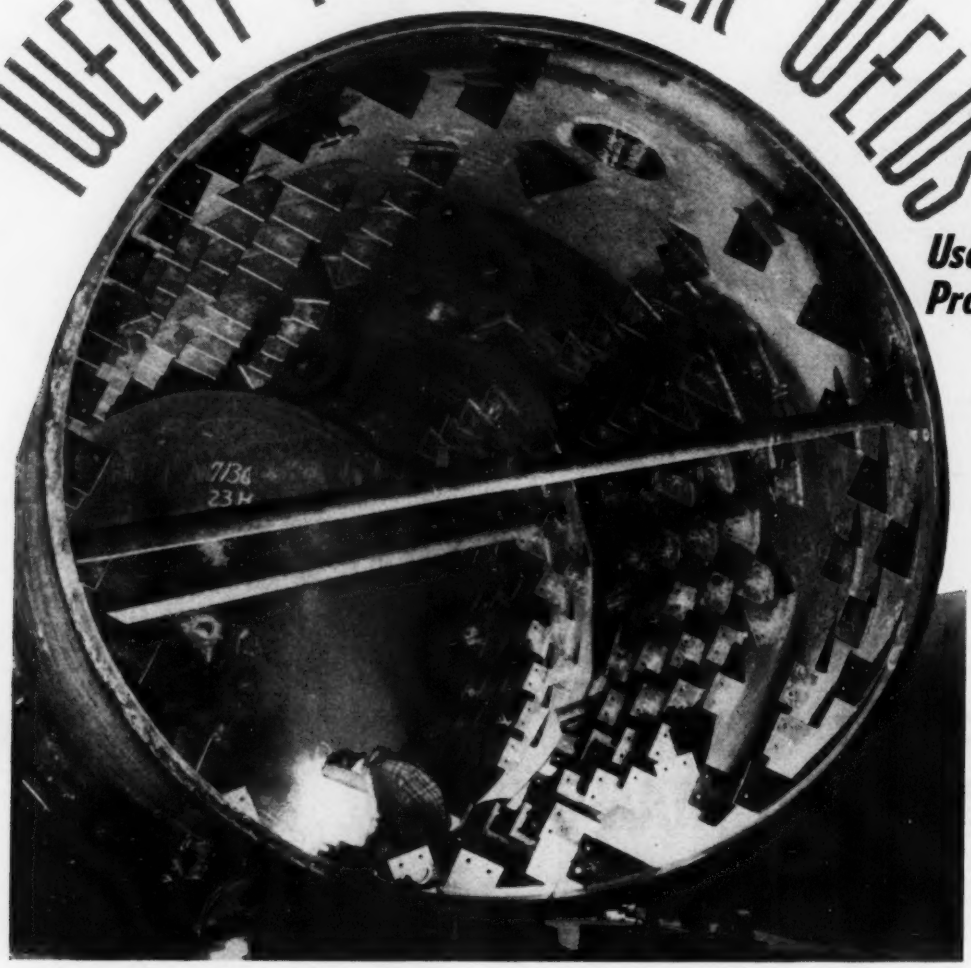





Complete cycle of machining operations on B. and M. Diesel car wheel: Bore A; Turn Radius B; Straddle face C-D; Semi-finish bore A; Semi-finish E-F; Cut 20° angle, upper F; Finish turn E-F; Cut 45° angle G to D; Finish face D; Finish bore A; Chamfer bore H; Finish ¾" rad. B-J; Finish 13.000" dia. B-J; Face rim K; Cut wear limit groove M.

# TWENTY-FOUR LAYER WELDS

## Used in Fabricating Propane Decarbonizing Towers



*Welder installing brackets for support of trays and pipe coils in the 175-ton propane decarbonizing tower using a ferritic low hydrogen type of electrode developed for welding of armor plate*

FABRICATION of two 175-ton propane decarbonizing towers each 12 feet in diameter, 75 feet long and 2⅝ inches in wall thickness for installation in two foreign refineries by M. W. Kellogg Co., Jersey City, N. J., required special equipment and manufacturing skill because of the rare combination of plate thickness and vessel diameter. Most pressure vessels are less than 1½-inches in thickness because additional wall thickness introduces many problems in bending, welding and handling.

Unusual wall thickness is necessary to withstand an internal pressure of 500 pounds per square inch and to provide ⅛-inch of corrosion allowance due to presence of active sulphur compounds in the reduced crude oil which will be processed. A safety factor of five was used in the design of the vessels.

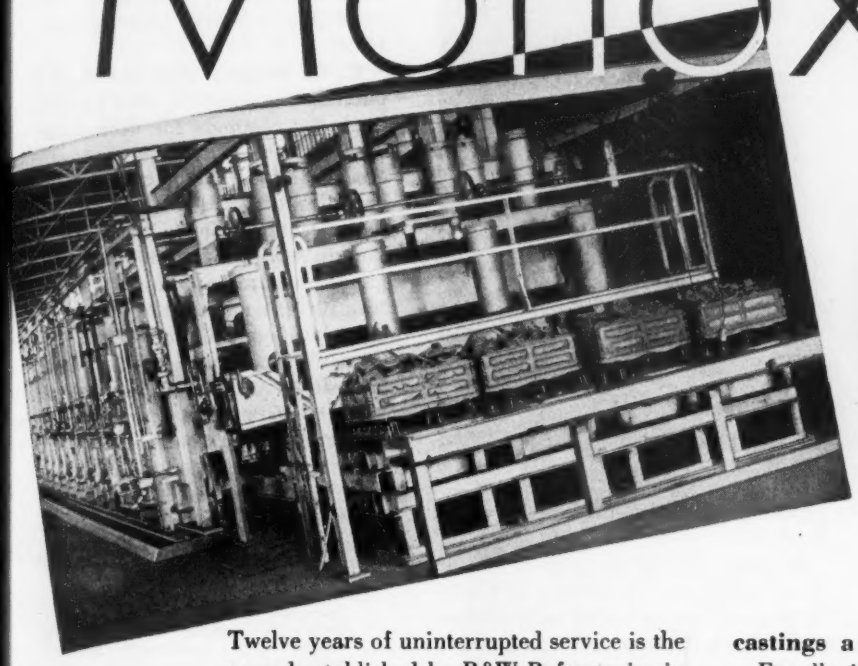
Carbon-silicon steel with a tensile strength of 70,000 pounds per square inch was the principal construction material. Precise welding control was therefore necessary to prevent cracking of the weld or metal adjacent to the weld and to develop a weld strength equal to that of the plate. Company metallurgists had previously worked out the optimum preheat range for this steel by welding under various preheat temperatures and then x-raying and microscopically examining the metal. During shop welding of the vessels, the preheat range was accurately adhered to by measuring the metal temperature.

Approximately 24 layers of metal were required in each joint with each layer deposited after careful removal of slag from the previous layer. Continuous submerged arc welding was used on all principal joints with several design features developed by company engineers incorporated into the welding machines. Welding of external and internal attachments was performed manually, as shown in the above illustration, using a ferritic low hydrogen type of electrode.

Inspection of welds included the radiographing of all main butt joints, using a 400 kilovolt peak x-ray unit and magnetic particle inspection of all strength welds not radiographed. Also, test plates were welded as continuation of longitudinal seams and were tested destructively, to verify joint strength and utility in accordance with requirements of Lloyds Register of Shipping Rules for welded pressure vessels. Tests included all-weld tensile, joint tensile, bend, impact, hardness and photomicrograph specimens. The finished vessels were stress relieved in specially constructed furnaces to remove locked-in stresses.

Flat plate for the towers was hot rolled in six equal sections, using an optical pyrometer for control of bending temperature. Despite thickness of the plate, sections were rounded up to be well within the tolerances allowed by American Petroleum Institute and American Society of Mechanical Engineers codes.

# Carbon Monoxide



## NO MENACE TO B&W REFRACTORIES

Twelve years of uninterrupted service is the record established by B&W Refractories in a continuous malleableizing furnace operating under high CO atmosphere.

Refractories previously used in furnaces of this type disintegrated rapidly due to the reaction between the prepared atmosphere and impurities in the brick. But with B&W Refractories, brickwork maintenance has been negligible.

*Today, this furnace and five similar furnaces in the same plant—all equipped with B&W IFB linings and B&W 80 Firebrick piers*—**are malleableizing 450 tons of castings a day without interruption!**

Equally important, the use of B&W Insulating Firebrick has helped to reduce cycle time from 72 hours—required in old type furnaces lined with heavy firebrick—to 30 hours. Significant fuel savings, and improved product quality through closer temperature control have also been achieved.

If you are looking for ways to increase your production and decrease your costs, the use of B&W Refractories in your furnaces will prove of assistance. Your local B&W Refractories Engineer will be pleased to discuss your problems with you.

**B&W REFRACTORIES PRODUCTS**

B&W 80 FIREBRICK • B&W JUNIOR FIREBRICK
B&W 80 GLASS TANK BLOCKS • B&W INSULATING FIREBRICK
B&W REFRACTORY CASTABLES, PLASTICS AND MORTARS

•

**OTHER B&W PRODUCTS**

Stationary & Marine Boilers and Component Equipment
Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers
Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

**BABCOCK & WILCOX**

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

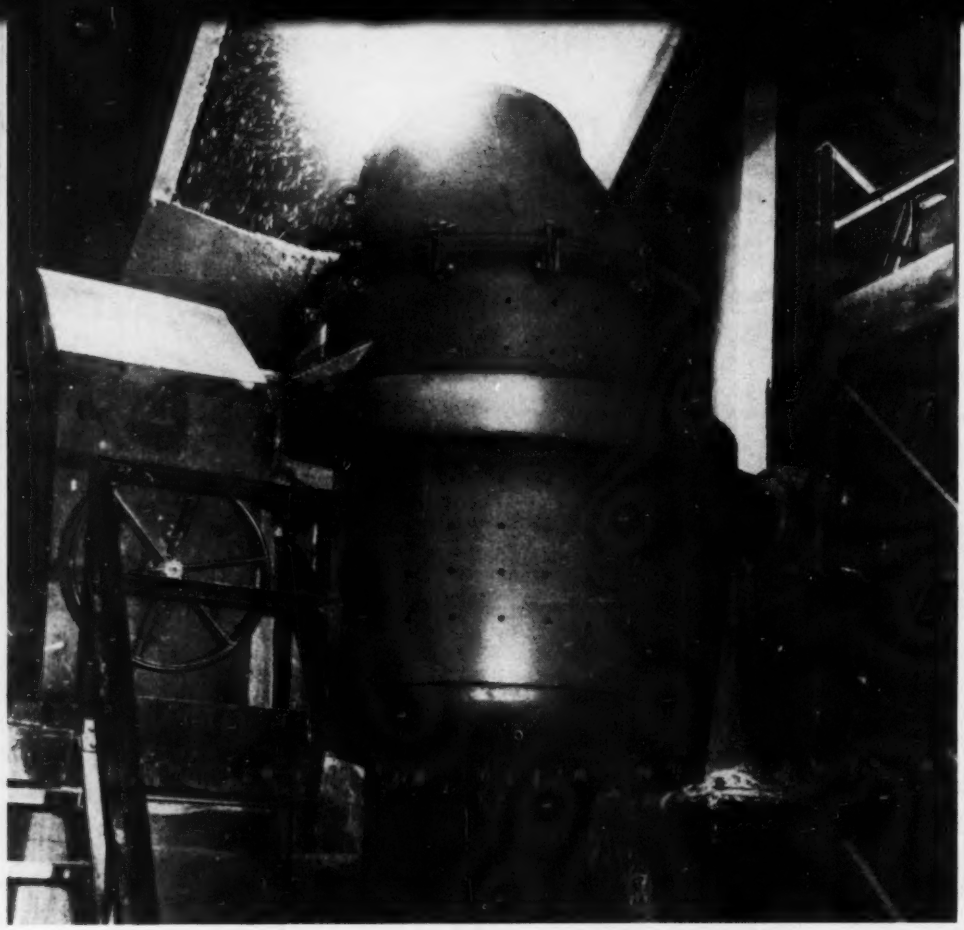


*Fig. 2—One of a battery of four 6-ton converters in operation*

properly made and properly deoxidized.

An important foundry in the middle west which has operated side-blow converters for over 30 years, will accept any specification for steel castings which is acceptable to the manufacturers of electric steel castings. During the last war, this foundry made ordnance steel castings without a single rejection due to chemical composition or physical properties. Typical results obtained at this foundry are shown in Table I.

A converter foundry in Michigan during the last war made millions of tractor shoes for tanks, which in competition out-performed shoes made by any other process. Average results of tests made on steel produced by this company are shown in Table II.

Because all of the converters in America—both bottom-blow and side-blow—are operated with acid linings, removal of phosphorus is impossible in the vessel. Our phosphorus ores are rapidly becoming exhausted, and as a result, large tonnages of bessemer metal are now charged into basic open-hearth furnaces for removal of the phosphorus.

Mr. Gordon Yocom, Wheeling Steel Co., developed and perfected in 1940, a method for dephosphorizing bessemer steel in the ladle. With the Yocom method, 70 per cent of the phosphorus in steel can be removed with certainty in a matter of seconds.

In the foundries, steel scrap is melted in cupolas where sulphur is picked up from the coke in various amounts—the percentage increase ranging from 0.04 to 0.08, depending on the percentage of sulphur in the coke. The sulphur problem was solved by treatment in the ladle with alkali slags prior to delivery of the metal to the converter. An excellent article on this subject by G. S. Evans, Mathieson Alkali Works was published in 1942[1].

E. C. Wright, National Tube Co., published a report in 1944 concerning improved methods for deoxidation of bessemer steel[2]. His method consists essentially of deoxidation within the vessel with hot metal containing over 4 per cent carbon, and final deoxidation in the ladle with silicon, manganese and aluminum. At that time, Mr. Wright reported that over 300,000 tons (representing 6000 to 10,000 heats) of bessemer steel, deoxidized as described, had been processed into almost every size seamless tubing. Among his conclusions are the following:

1. Yield strength and fatigue properties of killed bessemer steel are superior to those of open-hearth steel of the same tensile strength.
2. Ductility and toughness of killed bessemer steel at both room and sub-zero temperatures is equal to the ductility and toughness of open-hearth steel of the same tensile strength provided both steels are thoroughly killed with the same deoxidizing practice.

Incidentally, converter steel foundries for many years have used hot metal from the cupola for deoxidizing and recarburizing the steel within the vessel in the same way in which Mr. Wright uses blast furnace metal.

An article by H. W. Graham, Jones & Laughlin Steel Corp., published in 1940[3] says:

"In the past several decades bessemer steel making has been neglected alike by management, sales operators and technologists. It would be hard to find in any phase of the steel industry a more fruitful field for research than the bessemer process of

**TABLE I**

**Typical chemical and physical properties of converter steel. Test bars machined from coupons attached to castings. Normalized at 1600°F. Tempered at 1100° to 1200°F.**

| Heat | Chemical | | | | | Physical | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. | C. | Mn. | Si | P. | S | Tensile | Yield Pt. | Elongation | Red. Area |
| 10 | .28 | .61 | .42 | .027 | .036 | 81500 | 48000 | 28.5 | 43.4 |
| 11 | .26 | .70 | .40 | .029 | .024 | 76650 | 43400 | 32.5 | 53.1 |
| 12 | .30 | .72 | .38 | .031 | .026 | 83500 | 48500 | 27.0 | 45.5 |
| 13 | .27 | .66 | .33 | .028 | .027 | 73000 | 44250 | 33.0 | 46.3 |
| 14 | .28 | .72 | .40 | .029 | .026 | 73250 | 45000 | 32.0 | 54.4 |
| 15 | .24 | .67 | .40 | .029 | .033 | 73200 | 42500 | 33.0 | 57.0 |
| 16 | .27 | .80 | .36 | .037 | .031 | 78000 | 47000 | 27.5 | 44.0 |
| 18 | .25 | .65 | .36 | .030 | .038 | 76600 | 45750 | 30.5 | 52.8 |
| 19 | .28 | .70 | .36 | .031 | .026 | 76750 | 49500 | 32.0 | 55.5 |
| 20 | .26 | .73 | .40 | .032 | .023 | 76750 | 43000 | 33.5 | 58.3 |
| 21 | .27 | .60 | .38 | .023 | .027 | 76250 | 46250 | 27.5 | 38.2 |
| 22 | .27 | .73 | .37 | .027 | .022 | 79700 | 44750 | 31.0 | 57.3 |
| 23 | .26 | .72 | .36 | .039 | .026 | 76500 | 45700 | 32.5 | 58.3 |
| 24 | .30 | .76 | .32 | .030 | .021 | 80500 | 45500 | 29.5 | 46.3 |
| 25 | .26 | .73 | .37 | .033 | .020 | 80500 | 45000 | 29.5 | 54.1 |
| 26 | .29 | .85 | .42 | .039 | .024 | 84250 | 49500 | 30.0 | 51.9 |

**TABLE II**

**Alloy steel made by triplex process, Cupola-Converter-Electric Furnace. Average of several hundred tests. Castings were tractor shoes quenched in water at 1550°F. and tempered at 1200°F.**

| Chemical | | Physical | |
|---|---|---|---|
| C. | .31 | Tensile | 115000 |
| P. | .031 | Yield Point | 90000 |
| Mn. | 1.29 | Elongation in 2" | 24% |
| Si. | .55 | Reduction Area | 56.7% |
| S. | .036 | Brinnell | 255 |
| Cu. | .53 | | |
| Mo. | .35 | | |

today, or any field wherein results would contribute to larger or more important economic and commercial considerations."

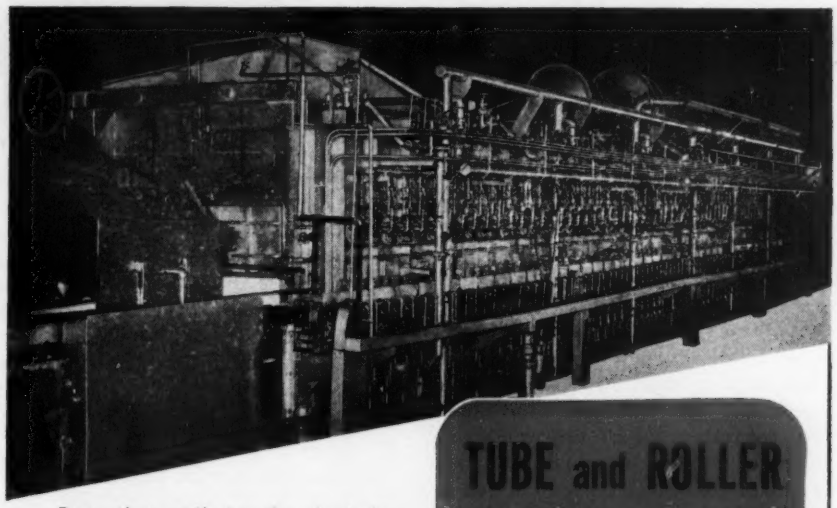
Mr. Graham's presentation is very thorough and practical. It is well worth the time of any steel man for its careful perusal. The paper is prophetic in that the author foresaw the present day scrap shortage, and predicted an increasing use of the bessemer process, which is practically independent of scrap supply. Jones & Laughlin Steel Corp. accomplished a tremendous amount of work with the converter process—both bottom-blow and side-blow—and the development by Mr. Graham and Dr. Work of the photo-electric cell as an instrument for determining the end-point of the blow, has gone far to eliminate the human element in this respect.

Until very recently, the side-blow vessel was entirely neglected in steel mills, and its use confined almost exclusively to steel foundries. Foundry units range in capacity from 1 to 6 tons, and for a great many years a vessel of 6-ton capacity was considered to be maximum size for side-blow operation. A side-blow vessel of 11-ton capacity was operated experimentally by a large steel company and produced an excellent grade of steel. Nitrogen pick-up was a mere fraction of that for bottom-blow operation, many heats showing as little as 0.003 per cent. One large steel company is now experimenting with a side-blow vessel having a capacity of 22 tons.

Side-blow operation is similar to that for the standard bessemer unit, chemical reactions being identical. The blowing operation is slower, requiring 15 to 20 minutes compared to 10 to 12 minutes for the bessemer. Slower operation is due to the fact that contact between the blast and metal is on the surface of the bath.

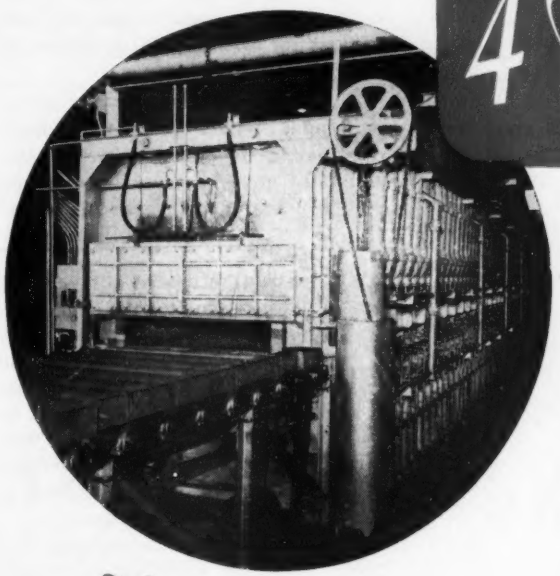
The slower operation makes for better control of the blowing operation, different periods of the blow being more readily distinguishable, and there is also much less danger of over-blowing, because the blast can be turned off immediately upon the drop of the flame. With bottom-blow operation the vessel must be turned down to a horizontal position before stopping the blast, which usually requires about 25 seconds. Ability to stop the blast promptly is important because, as one writer has put it "with the blast on, the heat begins to commit suicide when carbon, manganese and silicon have been reduced to very low percentages."

Assertion has been made that the

Recently installed in the plant of a large steel producer, this 5'6"x70' annealing furnace is used to anneal stainless steel sheets. It is equipped with *CARBOFRAX radiant tubes and rollers. (*CARBOFRAX is a registered trade-mark indicating manufacture by the Carborundum Company.)

TUBE and ROLLER HEARTH FURNACE UPS PRODUCTION 4 Ways



The improved design of this new GASMACO furnace has resulted in these production economies to the user: (1) manpower requirements reduced by 60% (2) stainless steel sheets are uniformly annealed within 2 points of hardness—surface finish is free of defects (3) pickeling time reduced to 20% (4) polishing time reduced 50%.

These production economies reflect GASMACO's 45 years' experience in industrial furnace engineering and manufacture—experience available to you on your next heat-treating job.

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bessemer converter shows a lower blowing loss than the side-blow vessel but this is open to serious question. Comparisons are usually made between 2 or 3-ton foundry units and the large 25-ton vessels used in the mills. Size has a definite influence on the blowing loss which is proved by the records of 6-ton foundry vessels compared with those of 2 ton capacity. Large 25-ton bessemer converters are claimed to show a blowing loss of 8 per cent to 10 per cent and many small foundry vessels of 1 to 2-ton capacity show 10 to 12 per cent. The writer has operated 6-ton side-blow converters where the weight of the metal charged compared with the weight of the metal tapped showed a loss of about 9 per cent.

Reports on lining life seem to indicate a better performance with the bessemer. Possibly the mills are using better refractory material than the foundries and are taking more time to install it properly. The body section of the bessemer converter is usually lined with fire-stone, whereas foundries use silica-brick or a monolithic rammed ganister and clay mixture. The bessemer is at a disadvantage in one respect, its bottom section with the tuyeres is good for only 20 to 25 blows. Several bottom sections are required for each converter, completely lined with tuyeres installed. A battery of drying ovens is required to obviate any delay in operation. The bottom sections are installed with the use of a powerful hydraulic jack-truck, which is a rather expensive piece of equipment.

In foundry operations, converter linings last for 100 blows if properly installed and dried. Foundry operation is hardly comparable to that in the mills because the converter is seldom operated for more than 8 hours and is cooled down every night and over week ends. Also, steel temperatures for the manufacture of castings are necessarily about 200° F higher than for ingot production.

In connection with higher temperatures, it is a recognized fact that side-blow operation produces steel at a higher temperature for a given composition of the charge. It is accepted practice for bottom-blow operation to turn the vessel down and side-blow when a cold blow occurs.

In foundries producing large tonnages, a spare shell is kept lined, ready for use, which can be exchanged for the one in operation in about 30 minutes time.

The side-blow converter has many advantages which steel mill operators would do well to investigate. Quality of steel produced is superior to that made by the standard bessemer converter as evidenced by the fact that the bottom-blow unit has never been successful for the manufacture of castings.

Initial cost for a side-blow installation is less than half that of the standard bessemer of equavalent capacity. Blast pressure required for bottom-blowing is 20 to 25 pounds as compared with 4 to 5 pounds for the side-blow. This means that 150 horsepower is required for the blower motor for every ton in the vessel, which compares to only 40 horsepower per ton for the side-blow converter. Difference in cost for blowing equipment accounts largely for difference in cost for the two units.

Experiments have been made abroad using oxygen enriched blasts in converter operation, but no definite information exists in this country at the present time as to the results. A research project to determine the value of oxygen should reveal some interesting possibilities — certainly speed of operation could be improved, and probably higher temperatures produced with lower silicon requirements.

**REFERENCES**

(1)—Metals & Alloys, July, 1942.
(2)—Metals Technology, June, 1944, technical paper #1692.
(3)—Metals Technology, Oct. 1940, technical paper #1232.

# ALUMINUM
## Fuel Tank
# WELDING

*. . . recommendations designed to meet Underwriters' Laboratory requirements*

UNTIL recently aluminum fuel oil storage tanks submitted for testing to Underwriters' Laboratories were not satisfactory due to joint designs used in connection with welds. Recently, The Linde Air Products Co., New York, issued several recommendations for successfully meeting requirements through use of Heliarc process.

According to the company, one of the primary considerations involves use of proper jigs and fixtures to maintain alignment. Following these preliminary preparations, it recommends an aluminum of 3S-½ hard type, 0.102-inch thick, with heads and wrapper sheets cold-formed. Radius of heads at knuckles between head section and flange should be at least ½-inch. Although the head could be flat, reinforcement such as ribs pressed into the head, or a dome shaped head are preferable from a distortion standpoint.

All welds to be made on this tank should be of lap weld design. Wrapper sheet should be set back from the knuckle radius on the head by at least ⅝-inch and no more than 1¼-inch. Minimum overlap of ½-inch should be maintained on all joints. Longitudinal weld in wrapper sheet should also be lapped for at least ½-inch.

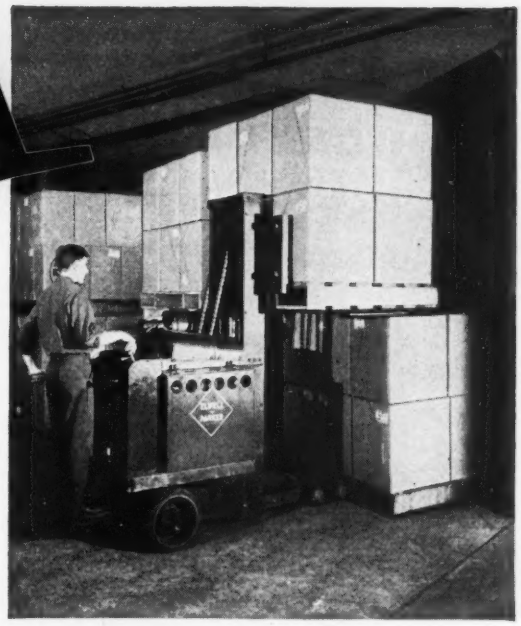
**Power Recommendation** — Power should be supplied from a 200 ampere continuous rating alternating current welding transformer with high frequency superimposed (300 amperes, 50 per cent duty cycle). A 2S filler rod should be used throughout. Indicated amperes of 140 to 170 should be used on a ⅛-inch electrode with an argon flow of 8 liters per minute. Electrode should extend ⅛ to 3/16-inch beyond the No. 7 ceramic cup.

Welds whenever possible should be made in flat position and a 3/32-inch 2S filler rod should be added to joint at rate of approximately 1 inch of rod per inch of weld. Resultant fillet should be well rounded with no evidence of undercutting on either top or bottom sheets. Welding speeds from 8 to 10 inches per minute should be maintained. If welding speeds drop below 8 inches per minute, excessive plate heating will cause a wide band of annealed material adjacent to weld. Fittings for inlet and outlet gages and drains should be welded to wrapper sheet prior to final assembly.

**Wrapping Sheet Forming**—Wrapper sheet should be formed over the tank heads and latter tack welded to wrapper sheet starting in the center where wrapper sheet contacts each head, working around both sides until longitudinal seam is reached. Longitudinal seams should then be tacked starting in center and working out toward edges. This procedure will eliminate most of the distortion for final welding.

After tacking, weld may be started on one side of longitudinal seam and carried completely across tank. Head seams may then be welded by starting at longitudinal seam, going around heads and finishing at longitudinal seam. Care should be taken

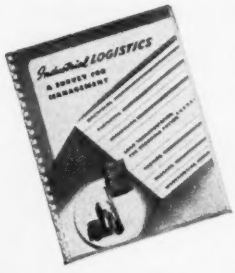
# Consider the advantages of Low and High Lift Trucks



On many jobs, either Low or High Lift power trucks are better suited than fork trucks. Their lighter weight is advantageous where floor or elevator capacities are limited, and they are lower priced than comparable fork models. Low or High Lift Trucks are not as heavy because the load is *over* the wheelbase—fork trucks must be counterweighed, usually with lead.

High Lift Trucks can have forks substituted for platforms for palletization.

Your near-by EP man will offer *unbiased* advice about the proper type of truck for your needs, because Elwell-Parker produces *ALL* types—fork, low lift, high lift, cranes and tractors. The Elwell-Parker Electric Company, 4501 St. Clair Avenue, Cleveland 14, Ohio.

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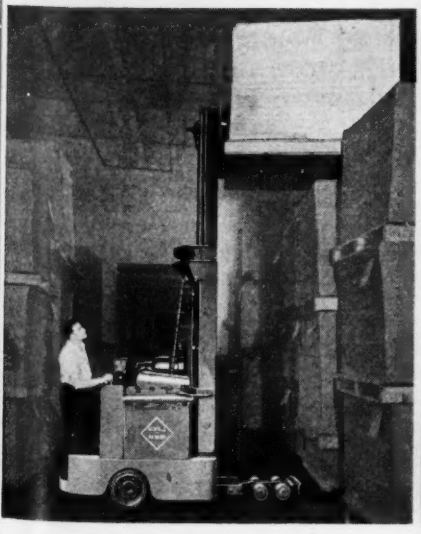

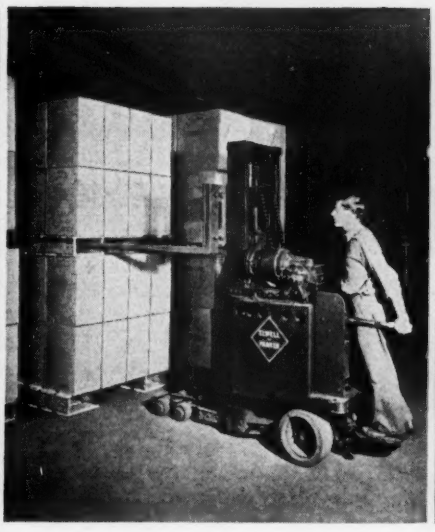

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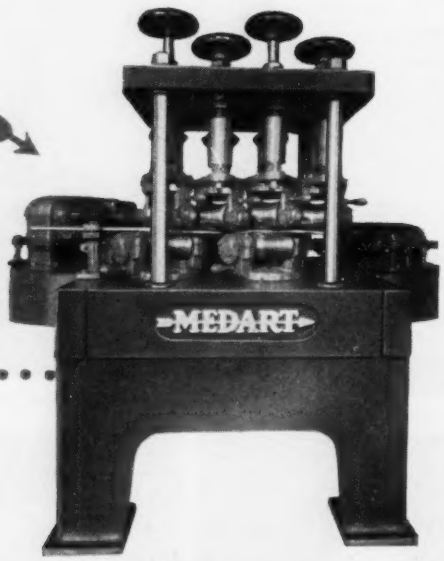


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to fill all craters before stopping weld. Beads at start and finish should overlap for at least ½-inch.

Most desirable method for making threaded fittings for pipe connection employs forged fittings tapered down to edges equaling sheet thickness and butt welded in place. An alternate method is fabrication of fittings stamped from heavier plate. These are set flush with inside of tank and finished with a fillet weld outside.

**Leg and Bracket Welding**—Legs and mounting brackets can be directly welded to shell by use of fillet welds. These legs should have considerable bearing area and if possible extend from one side of tank to the other. Considerable distortion will be experienced in the sides of shell when mounting brackets and legs are welded.

Use of an edge weld for joint design is discouraged due to low strength obtained, and butt welds are not recommended due to skill required for fitup and welding and because of jigs required for alignment of joint edges when welding.

## Plans for Symposium On Surface Chemistry Set

Fourth symposium on surface chemistry, sponsored jointly by Cleveland sections of American Chemical Society, Electrochemical Society and American Institute of Chemical Engineers is to be held at the Hotel Carter, Cleveland, Sept. 25.

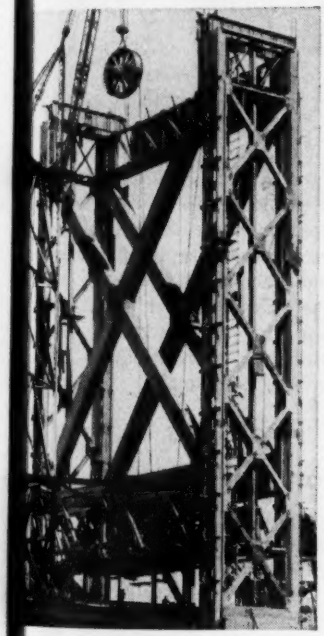
Both a morning and afternoon session is planned. The first session, beginning at 10 a.m. is to include two papers besides that of the keynote speaker, Allan T. Gwathmey, University of Virginia, who will discuss "Crystal Structure and Surface Behavior". "Developments and Trends in Industrial Catalysis" will be the talk presented by James H. Boyd, New York, consultant in hydrocarbons and marketing. W. S. Loose, director, laboratory development division, Magnesium Laboratories, Dow Chemical Co., will talk on "Surface Reactions of Magnesium as an Anodic Material."

Following the scheduled luncheon, at which reservations are required, V. M. Darsey, president, Parker Rust Proof Co., will speak on "Phosphate Coating of Metals". Second speaker of the afternoon will be H. C. Miller, chief chemist, Charles Hardy Inc., who will talk on "Principles of Powder Metallurgy". Windup talk of the afternoon will be presented by C. W. Patton, manager, coating and adhesive materials division, Bakelite Corp., in which he will discuss "New Developments in Organosols and Plastisols."

# . . . HIGH, WIDE and HANDSOME

**RIDGE COMPRISES** 3,275′ of girder pproach spans; two 184′ flanking uss spans; one 240′ vertical lift pan with two supporting towers. he bridge carries two 35′ roadays with 5′ dividing strip and two sidewalks. United Concrete Pipe orporation, General Contractors.

**HE 240′ LIFT SPAN** in the raised osition provides 175′ clearance ove the channel. In addition to bricating and erecting the struc-ral steel for this bridge, Amer-an Bridge also furnished and in-alled the operating machinery, ectrical and auxiliary equipment. Old bascule span shown in the ckground)



**MERICAN BRIDGE** erecting one of he 28-ton grooved sheaves on the outh Tower.

THE Commodore Schuyler F. Heim Bridge over Cerritos Channel, dedicated on January 10, 1948, eliminates a serious traffic bottleneck between Terminal Island and the mainland in the Port of Los Angeles area.

American Bridge Company fabricated and erected the superstructure, which carries 6 lanes of traffic and features a movable span of exceptional size and lift — 19,920 sq. ft. in area, and lifting 125 feet from closed to open position.

This bridge, the major link in the Terminal Island Access Freeway project, was built for the United States Navy. American Bridge also fabricated and erected 6 of the other 7 bridges in the Freeway, for the California Division of Highways.

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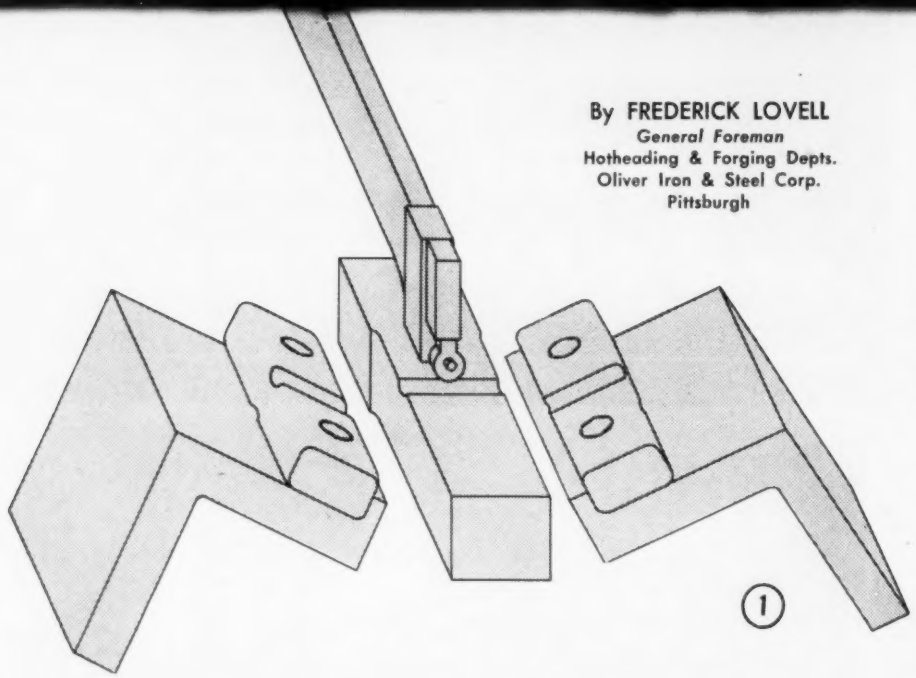
UNITED STATES STEEL

By FREDERICK LOVELL
*General Foreman*
Hotheading & Forging Depts.
Oliver Iron & Steel Corp.
Pittsburgh




# Hard Die Inserts

## ...increase die life, cut down-time and decrease cost per unit

APPLICATIONS of the principle of using hard die inserts to increase production per die change often result in considerable savings in die and installation costs. The problem which faced Oliver Iron & Steel Corp., Pittsburgh and the solution adopted illustrates the value of searching out new ways to make die inserts produce results.

Specification called for a ⅝-inch diameter U-bolt made from a 0.35-0.45 carbon steel with a nearly perfect radius in the bend and a tolerance between the legs of plus or minus 0.010 inches. Bolt is made from a straight piece, threaded on both ends and then cold formed into a U by bending it around a die of proper radius.

Fig. 2 shows the original die setup consisting of a lengthy mandrel of 0.95 carbon steel, forged, hardened and ground to a size that would produce the desired inside radius in the bolt. Working with this mandrel die were two traveling saddle dies made of the same grade of steel. A groove in each saddle die secured the piece and bent it around the mandrel die with an upward movement.

Pressure and wear of bending the steel deformed these dies beyond tolerance limits. Mandrel dies were good for about 7000 pieces and saddle dies for about 12,000 pieces. Replacement entailed entirely new or refinished dies which were relatively costly and required considerable installation time.

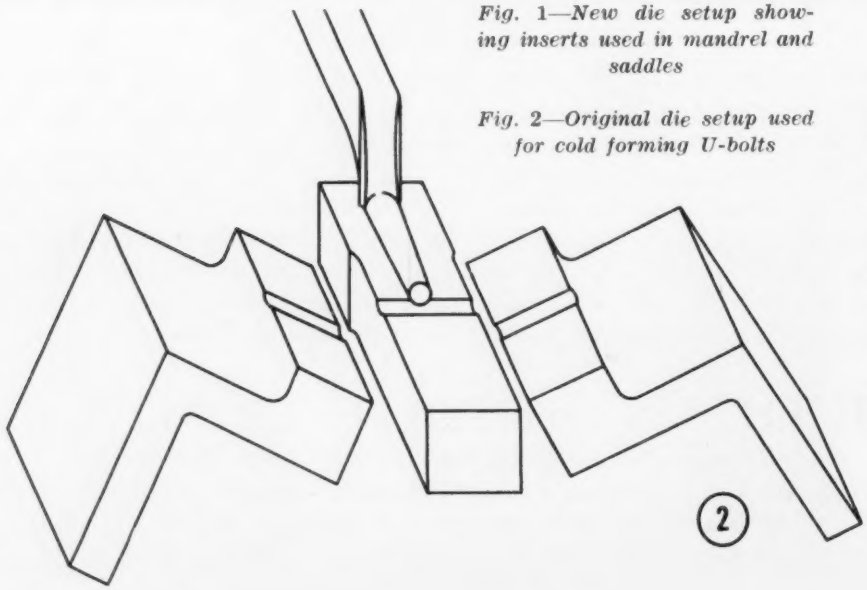
Shown in Fig. 1 is the revised die setup which takes inserts of hardened tool steel. A similar mandrel is used to hold the insert so that the working pressures are still absorbed by the mandrel, insert is merely held in place by a cap screw.

Traveling saddle dies have been transformed to include inserts of hardened tool steel which have the required grooves in both sides. Since the work pressures of bending affect only upper end of groove, each insert can be turned end for end and later turned over and used on the other side so that four individual die surfaces are presented by each insert before complete removal is required. The inserts are of high carbon, high chromium tool steel.

As a result of die insert on the mandrel, die life has climbed from about 7000 pieces to better than 35,000 pieces, or more than 500 per cent. Use of inserts on the saddle dies has caused die life to climb from about 12,000 pieces to better than 75,000 pieces, or more than 600 per cent. Down time for replacing worn die parts has decreased about 75 per cent for the mandrel and about 20 per cent for the two saddles. Die cost per unit has been reduced approximately 350 per cent.

*Fig. 1—New die setup showing inserts used in mandrel and saddles*

*Fig. 2—Original die setup used for cold forming U-bolts*

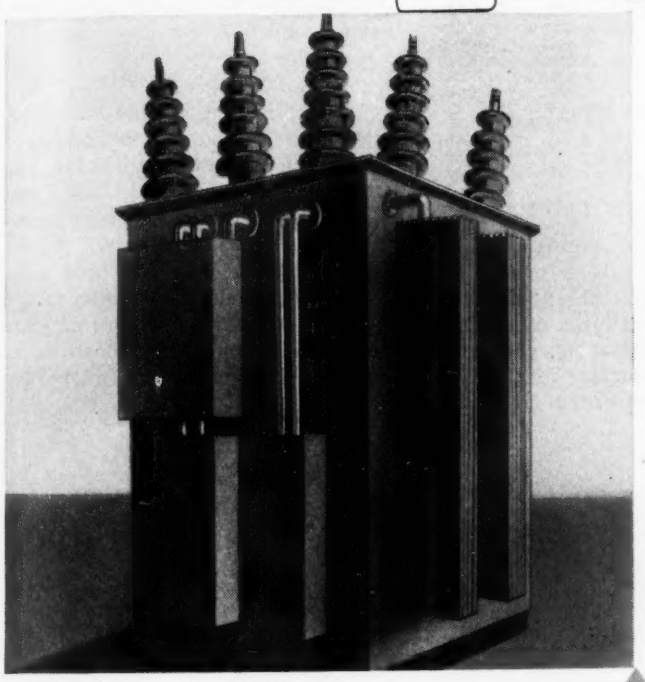



## Society Publishes Gray Iron Bulletin

Technical bulletin intended to assist engineers in specifying and designing gray iron components or parts was issued recently by Gray Iron Founders' Society, Cleveland, O. Practical foundrymen and buyers of castings will find the booklet entitled, "Gray Iron—Its Mechanical and Engineering Characteristics and Details for Designing Cast Components" a handy reference covering the many useful properties which gray irons provide.

Booklet explains fundamental considerations in designing castings and describes various engineering characteristics of gray iron.

# FOLLANSBEE SILICON STEEL



Every operation in the production and rolling of FOLLANSBEE ELECTRICAL SHEETS is rigidly controlled to assure uniform electrical, mechanical, and physical characteristics.

Manufactured in a variety of grades and gauges, FOLLANSBEE SILICON STEEL is suitable for all electrical design requirements.

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**URGENT: STEEL NEEDS SCRAP—KEEP IT MOVING**

# Impregnating Steel With Aluminum

## . . . improves corrosion resistance and conductivity

IMPREGNATION of steel and iron products by means of a method developed by Mr. Goran Moller serves as a protection against rust as well as against the action of many acids, fumes, and corrosive atmospheres according to Linden & Co., Los Angeles, which is issuing licenses for use of this process in the United States and Canada. The method, designated Mollerizing, was developed in Sweden and has been used by a firm in that country for a number of years.

Standard electric salt bath furnaces are used for aluminum impregnation. Base metal is degreased, descaled, thoroughly cleaned, and then lowered into the furnace containing principally barium chloride on which is floated a bath of pure aluminum. When the metal being treated has been raised to the heat of the salt, 1600-2000° F, it is removed through the aluminum.

As a result of the impregnation, the following occurs: Aluminum enters the pores of the steel, thereby forming an iron-aluminum alloy which when quenched may have a hardness as high as 550 brinell; an exterior layer is deposited which has all the corrosion resistant properties of pure aluminum.

Control of time and temperature provides the desired impregnation of aluminum into the base metal. By passing directly from the liquid barium chloride through the aluminum bath, the base metal is prevented from oxidizing. Surface of the aluminum bath is prevented from oxidizing by the salt vapors which form a protective blanket over it.

**COATING THICKNESSES**

| Time of dipping seconds | Al in | $Al_3Fe$ in |
|---|---|---|
| **Temperature 1328° F** | | |
| 1 | 0.0012 | 0.00031 |
| 2 | 0.0012 | 0.00035 |
| 5 | 0.0016 | 0.00043 |
| 10 | 0.0012 | 0.0008 |
| 30 | 0.0012 | 0.0012 |
| **Temperature 1508° F** | | |
| 10 | 0.0008 | 0.0031 |
| 20 | 0.0008 | 0.0035 |
| 60 | 0.0012 | 0.0039 |
| 120 | 0.0016 | 0.0059 |

Aluminum impregnated metals will take anodizing and coloring the same as aluminum and can be polished by the same methods. Value of the metal as a heat transfer agent is increased due to natural properties of aluminum. In addition, impregnation of wire and other electrical equipment improves conductivity of the metal.

Accompanying table shows thicknesses of aluminum and iron-aluminum obtained on samples of steel wire at different temperatures and length of time for dipping. Time is counted from the beginning of the treatment until material has attained same temperature as salt bath.

—o—

Standardization in the design of high pressure pumps manufactured by Aldrich Pump Co., Allentown, Pa., will permit the use of identical wearing parts such as: Bearings, crossheads, wristpins, and valves regardless of plunger diameter and number of plungers. This type of design will also decrease inventory of spare parts and reduce complications in ordering and accidental duplication of parts.

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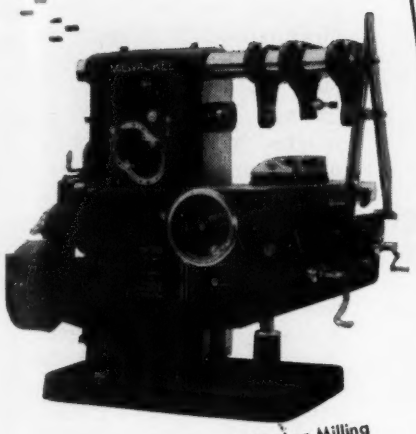
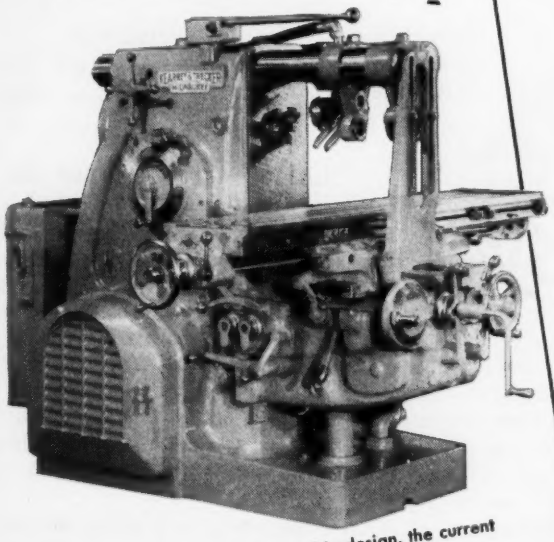
Tri-Boro Steel Supply Co., Inc.



1920—This Kearney and Trecker Milling Machine was one of the first to use Twin Disc Clutches.



1948—Advanced in design, the current Kearney and Trecker Milling Machine still uses Twin Disc Clutches.

# 1920-1948

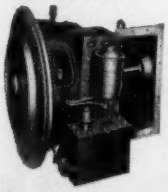
# Twin Disc *Equipped*

Kearney and Trecker Corporation, Milwaukee, Wisconsin, used Twin Disc Clutches on its machine tools as early as 1920. Kearney and Trecker still uses Twin Disc Clutches in 1948.

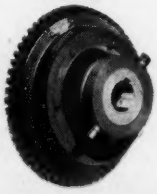
During the past 30 years, leading manufacturers of equipment for construction, logging, marine, petroleum, locomotive, farm implement, engine, and machine tool industries have found Twin Disc Clutches and Hydraulic Drives efficient units for power transmission.

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin, (Hydraulic Division, Rockford, Illinois.)

Hydraulic Torque Converter



Heavy Duty Clutch



Machine Tool Clutch

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U.S. PAT. OFF.

Tractor Clutch

Marine Gear

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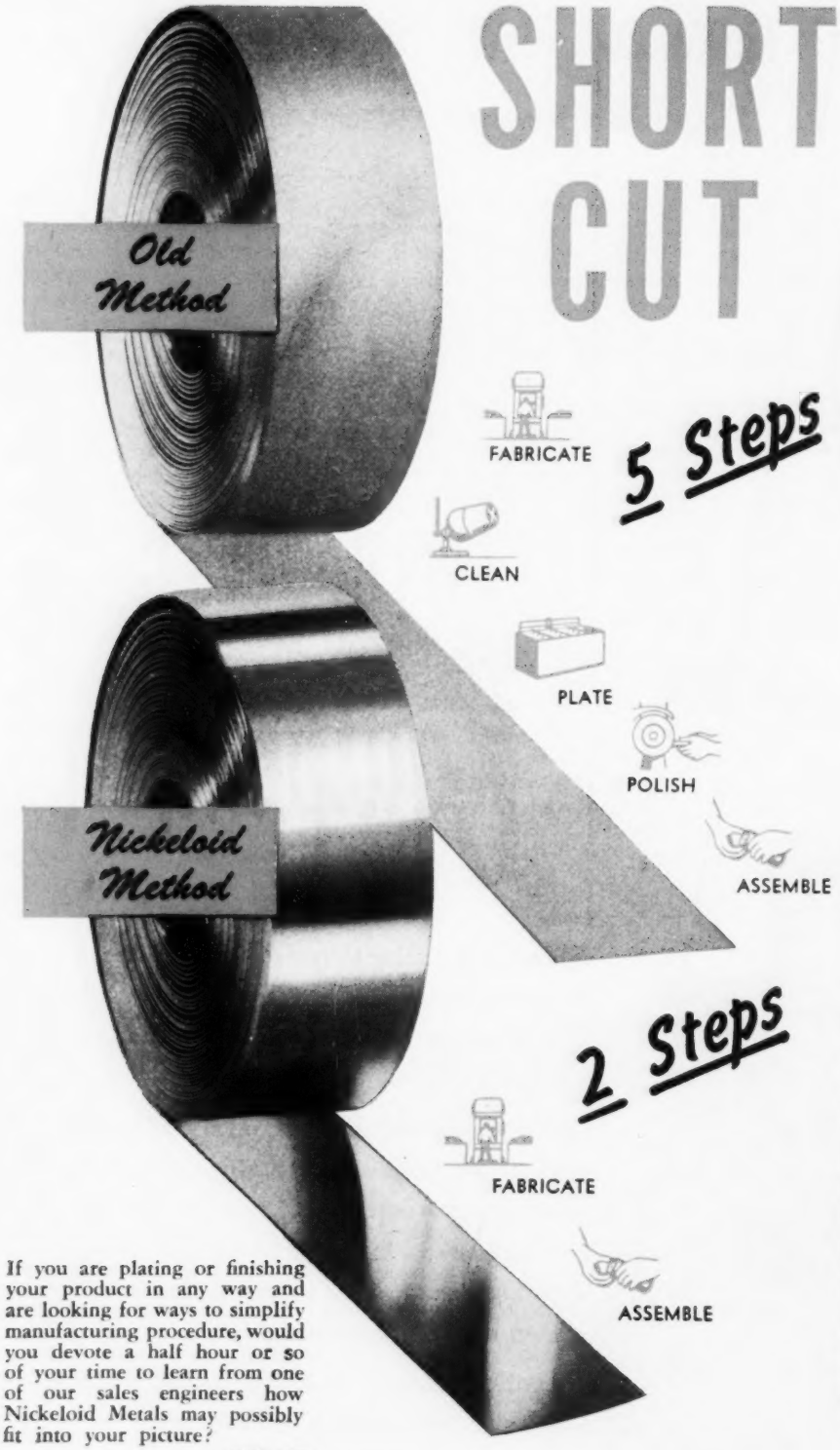


If you are plating or finishing your product in any way and are looking for ways to simplify manufacturing procedure, would you devote a half hour or so of your time to learn from one of our sales engineers how Nickeloid Metals may possibly fit into your picture?

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## Organic Finishes

(*Concluded from Page 82*)

greatest source of error in the above procedure is the film thickness measurements and obtaining a uniform film thickness. Another method that has been reported for film thickness measurements is to apply the organic coating film over amalgamated tin plate and then strip the film after baking. The film is accurately weighed in air, and then in a liquid of known specific gravity such as kerosene. From the two weighings the density con be calculated.

During the production application and the plant trial run tests, records should be kept of the amount of material consumed per unit, the film thickness obtained, and the results converted into square feet coverage per unit thickness. These data, to mean the most, should be taken after the application is adjusted to the best point, and operators are accustomed to the material. In such tests it is important that articles of approximately the same size and design be used for comparison of relative coverage values.


**REFERENCES**

61. Schuh and Kern, Ind. Eng. Chem. Anal. Ed. 3, 72 (1931).
62. Shaw and Moore, Anal. Chem., Oct., 1947.


## Lathe Tool Cutter Bit Grinding Shown in Film

Recently released by South Bend Lathe Works, South Bend, Ind., is the third in the series of 16 mm color sound films based on the book "How to Run a Lathe". It shows various steps necessary to properly grind and use cutter bits for lathe operations such as threading, facing, boring, forming, turning and cutting off.

Each step in grinding various types of cutting tools is shown in detail and the reasons given. Each type of cutting tool is shown in use and proper alignment with work emphasized. Thread cutting is shown step by step from the threading tool grinding, through setting up the lathe and starting and finishing thread.

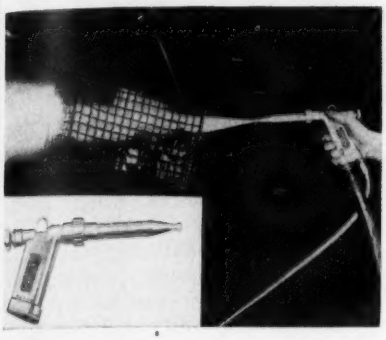
—o—

Chart suggesting the proper respiratory protection against more than 150 specific dusts, vapors and gases was published recently by American Optical Co., Southbridge, Mass. It presents a summary of recommendations made by the safety engineering division of the company for the use of three of their respirators, all of which have been approved by U. S. Bureau of Mines.

# New Products and Equipment

## Pressure Washer

Cold stream principle is utilized by the Hydro-Air, an improved industrial pressure washer manufactured by D & M Products Inc., 4655 Kingswell Ave., Los Angeles 27, Calif. Using a precisely-controlled mixture of water and compressed air, the unit produces a blast that penetrates

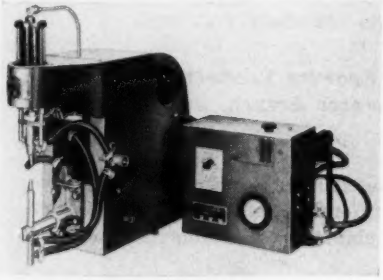


and cleans without back splash or harm to finish. Through use of adjustments, the washer can remove heavy dirt and grease or rinse cleaning solvent from sheets and parts, in metal processing, maintenance and repair and degreasing or paint stripping departments.

**Check No. 1 on Reply Card for more Details**

## Bench Type Spotwelder

For joining small metal parts, a new, fully-automatic 7½-kilovolt-ampere bench type spot welder was recently introduced by Weldex Inc., 7330 McDonald Ave., Detroit 10, Mich. The unit (752-PB) is engineered to handle light nonferrous metals



of the same or dissimilar alloy and thickness, on a high speed production basis; it will give low-cost operation on ferrous metals up to two thicknesses of 14-gage cold rolled steel or equivalent. High electrical efficiency is assured through superior transformer design coupled with a shorter secondary welding circuit.

In addition to air strainer, regulator, gage and lubricator, standard equipment includes: Built-in four-step transformer tap changing switch; single-acting air cylinder; magnetic long-life contactor; electronic timer. The welder is regularly furnished for 220-volt, 60-cycle, single-phase alternating current operation; this model is also available in 380 or 440 volts on special order.

**Check No. 2 on Reply Card for more Details**

## High-Lift Fork Truck

Maximum use of available headroom in high-stacking operations now may be made by employing a new 120-inch telescopic Worksaver electric truck announced by the materials handling division of Yale &

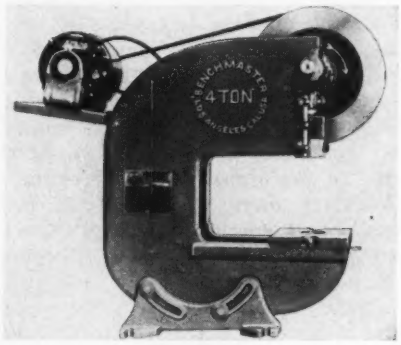
Towne Mfg. Co., 4530 Tacony street, Philadelphia 24, Pa. A tilting fork model, the unit has a capacity of 3000 pounds. Its unusually high reach, combined with a low lowered clearance (83 inches) is accomplished by means of a ram within a ram.

The truck travels at 2 miles per hour under full load, lifts a 2500-pound load at the rate of 8 feet per minute and tilts a full 18 degrees in 10 seconds. Total weight of the unit, including a 19-plate battery is 3640 pounds. Although fully powered in every respect, it is guided by a walking operator. Dimensions of the truck—33 x 64 inches—make it desirable where aisle space is narrow, or for use in loading or unloading freight cars or street trucks.

**Check No. 3 on Reply Card for more Details**

## Punch Press

Throat depth is increased to punch to the center of a 17½-inch circle, on the new deep-throat punch press recently announced by Benchmaster Mfg. Co., Los Angeles, Calif. Especially useful on sheet metal work as well as all jobs requiring deep horizontal space, the standard press has either a 1 or 1¼-inch stroke; strokes up to 2 inches may be obtained on special order. Ram position is adjustable and dovetails are gibbed for

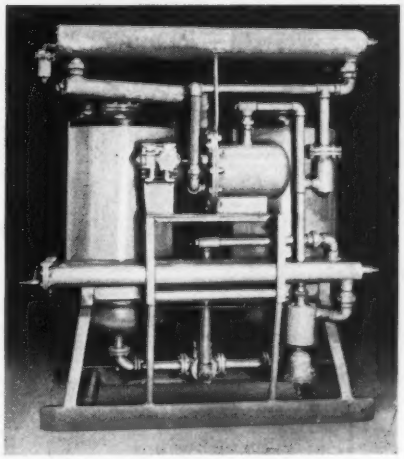



takeup if wear occurs. Press may be used either with or without the 1 x 6 x 8-inch bolster plate. Adequate power is furnished on most jobs with a ⅓-horsepower motor.

**Check No. 4 on Reply Card for more Details**

## Air Drying Machines

Dehumidification equipment in the form of a new line of machines designed primarily for drying instrument air is now being produced by Pittsburgh Lectrodryer Corp., Pitts-



burgh, Pa. Known as the BY line of Lectrodryers, the units are fully automatic, which makes possible the reactivation, cooling and reversal of the machines' dual adsorber towers without manual attention.

Simple and compact, standard dryers will be built for operation on pressures up to 150 psig with either steam or electric reactivation. There will also be a wide range of standard sizes up to 5000 standard cfm. Larger sizes will be available as special

machines. Moisture is removed from air and gases by the physical phenomenon known as solid adsorption. Activated alumina is the drying agent.

Check No. 5 on Reply Card for more Details

## Long Base Boring Machine

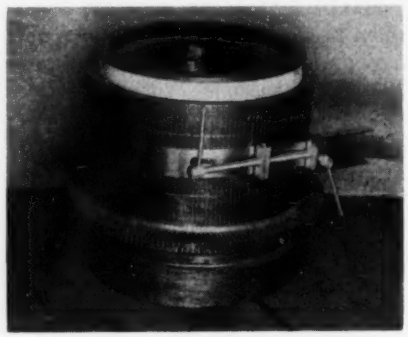
Heald Machine Co., Worcester 6, Mass., is introducing a new model 524 Bore-Matic machine with long base for extra capacity requirements. Powerful machine is capable of boring, facing turning, chamfering or grooving on such large, heavy work as cylinder blocks, connecting rods, large pump and compressor bodies, etc. Roughing and precision finishing can be performed at single setting. Seven or more individual boring heads or a special multispindle head unit to suit the job can be installed on each bridge.

Widely spaced, scraped V-ways and flat ways extend nearly the full machine length. Boringheads are lubricated for life and run cool. The low table, only 22 inches from the floor, simplifies machine loading. Up to 10 horsepower is available for heavy roughing cuts. Outboard tank and drive eliminate effects of heat and motor vibration. Hydraulic feeds remain constant regardless of oil temperature changes. Brake timing is adjustable and hydraulic circuit can be set for a wide variety of cycles, many of which may be entirely automatic except for loading and unloading.

Check No. 6 on Reply Card for more Details

## Multipurpose Clamp

Designed for use where a wrap-around clamp action is required, a multi-purpose clamp made by Marman Products Co. Inc., Inglewood, Calif., has been adopted by several large



electrical service shops to pull coils into place when rewinding armatures. By simply wrapping the clamp around each layer of coils and tightening locking device and take-up screw, intense pressure can be applied to force coils into position for final banding.

Clamp consists of a tough, interchangeable, stainless steel strap furnished in 1½ to 2-inch width of any desired length, square swivel assembly and cold-rolled steel take-up and locking screws. Unique design permits clamping of many different shapes and objects. Large diametrical take-up range is provided; pressure can be instantly released by backing off locking screw one-half turn.

Check No. 7 on Reply Card for more Details

## Seam Welders

Complete new line of roller-head seam welders embodying many new features is announced by Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich. Welders may be used either for continuous, water or gas tight seam welding, or for roll-spot welding and may be used for cold-rolled steel, stainless or other alloy steels, aluminum and other non-ferrous alloys as well as various types of coated metals.

Among the features of the new line is use of a head completely guided and aligned by 4 sets of antifriction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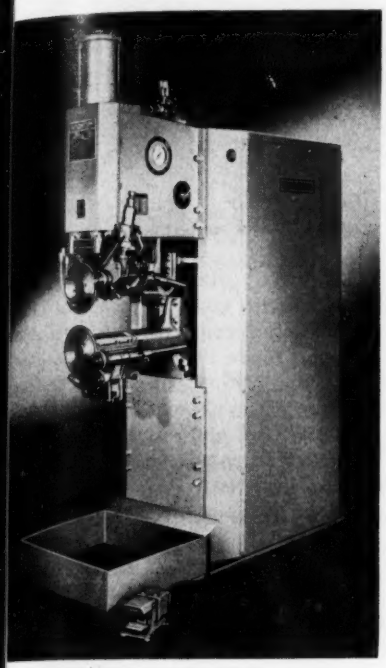
rollers, insuring that welding wheels will follow up and down even extremely small deviations in material thickness and contour. It is possible to maintain constant weld-pressures even where stock thickness varies



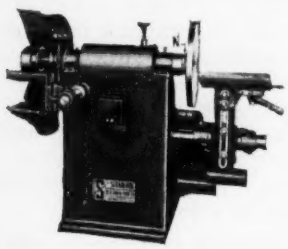
along the seam—assuring consistent even weld characteristics.

Three basic sizes comprise the line—light, medium and heavy duty. Each size is available in three types for circular, longitudinal or for both circular and longitudinal welding.

Check No. 8 on Reply Card for more Details

## Combination Grinder

Feature of the redesigned line of combination grinder-disk grinders now manufactured by Standard Electrical Tool Co., 2504 River road, Cincinnati 4, O., is thrust bearing construction. In each of the machines



it is no longer necessary to dismantle the spindle assembly to take up bearing wear because of an external adjustment feature now provided.

Each machine, according to the company, includes a self-contained belted motor drive. Enclosed ball bearing motor rides on an adjustable bed plate attached to the back of the pedestal, and power is trans-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mitted through multiple V-belts. Left side of machine shown is arranged for a maximum of 24 x 3 x 1¾-inch grinding wheel powered by a 10 horsepower motor. Right hand side is arranged to accommodate a plate mounted disk grinding wheel from 24 to 10 inches, depending on the size of the machine.

Check No. 9 on Reply Card for more Details

## Liquid Immersion Test Unit

With an operating range of 70 to 700°F, a new dual liquid immersion testing unit made by K & H Industrial Products Inc., 459 Morgan Ave., Akron 11, O., is designed for use in testing, calibrating and regulating thermometers, thermocouples, pyro-

meters and other temperature-indicating and control devices. The new unit, designated as model C-119, is of twin-tank design; each tank is equipped with individual temperature controls and liquid agitators. Use of two tanks facilitates double checking of each instrument at two different temperatures to determine percentage of accuracy throughout range of operation. Each tank is capable of holding approximately 4 gallons of fluid and will accomodate thermocouples up to 17 inches long.

Check No. 10 on Reply Card for more Details

## Dynamic Micrometer

Movement, radial displacement or vibration of any part made of ferrous metal are measured by a new electro dynamic micrometer, when used with the DuMont model 208 oscillograph or the equivalent. Manufactured by Electro Products Laboratories Inc., 549 West Randolph St., Chicago 6, Ill., the micrometer does not touch the moving part, and therefore does not interfere with its movement. Displacement is read on a conventional micrometer sleeve about 2 inches diameter, which is directly calibrated in thousandths and tenths of thousandths of an inch without resorting to a vernier.

All amplicfication is done at a constant "carrier" frequency which changes in amplitude with changes in displacement or vibration. The amplifier and oscillograph are used only to establish an amplitude reference level. Accuracy of the dynamic micrometer is the same for a static condition as for a dynamic condition corresponding to speeds up to 200,000 revolutions per minute.

Check No. 11 on Reply Card for more Details

• • •

**LUBRICATOR VALVE:** A positive metered amount of oil or grease is delivered to each bearing in lubricating systems by the Grannan lubricator valve, announced by Titeflex Inc., Newark 5, N. J. Light or heavy lubricants are dispensed without valve alteration. The fully hydraulic valve is installed directly into the bearing, operating from 0 to 300° F.

Check No. 12 on Reply Card for more Details

**CARBURIZING SALT:** A carburizing salt which is readily removed from oil quenched parts by immersion in hot water is announced by E. F. Houghton & Co., Philadelphia, Pa. Known as Perliton W, it is also used as a replacement for straight cyanide. Soluble in water, it can be used for case hardening of hard to clean parts, up to 1575° F.

Check No. 13 on Reply Card for more Details

**SPRAY GUN:** Both flocking and sand blasting operations can be performed with the light weight, all purpose spray gun developed by Blasto Spray Gun Mfg. Co., Los Angeles, Calif. Designed to operate off small air compressors, the non-bleeder type gun uses only 3 cubic feet of air per minute at 30 pounds pressure. Removal of trigger valve assembly permits use as bleeder type. Gun uses standard Mason jars.

Check No. 14 on Reply Card for more Details

**SPLASH GUARD:** Developed for gear shaving machines made by National Broach & Machine Co., Detroit, Mich., an air actuated electrically controlled automatic splash guard is available in several designs to meet varying conditions. After work is loaded, pressing of machine start button automatically closes the door, starts coolant and cutting cycle. Door opens automatically when cutting cycle is completed.

Check No. 15 on Reply Card for more Details

**SOLDERING IRON:** A chemical cartridge heats the Quik-Shot soldering iron, made by Kemode Mfg. Co., New York 19, N. Y., to working temperature in 5 seconds and maintains intense heat for 10 minutes. The cartridge about the size of a small flashlight cell contains a primer and is ignited in a manner similar to firing a bullet.

Check No. 16 on Reply Card for more Details

**SHELVING:** Hardwood shelves, reinforced with steel, and upright members of steel comprise the steel-wood shelving made by Lyon Metals Products Inc., Aurora, Ill. Easy shelf adjustment is made by adjustment with a shelf clip and stud. Dismantling and rearranging is possible. No bracing is required.

Check No. 17 on Reply Card for more Details

**GATE VALVE:** A more efficient, longer lasting motor is a feature of the new gate valve introduced by Hydro-Aire Inc., Burbank, Calif. Electrical portion of valve is in a self-contained package. Seals of valve may be removed without complete disassembly. Operation is on 18 to 30 volts and at temperatures up to 550° F.

Check No. 18 on Reply Card for more Details

**ROCK DRILL:** A 9-pound hand-held rotary rock drill that hits and rotates simultaneously is offered in a kit box with a Handi-Drill by Cleco Division of Reed Roller Bit Co., Houston 1, Tex. Included are spare parts, lubricating oil, 16 star drills and two chisels. Drill operates at 1800-2000 S. P. M.

Check No. 19 on Reply Card for more Details

**MOTORS, GENERATORS:** Designed for high performance servo and instrumentation applications is a line of induction motors and generators announced by Arma Corp., Brooklyn 32, N. Y. They are components for electromechanical computing and control equipment and servo-mechanisms in general.

Check No. 20 on Reply Card for more Details

**FOR MORE INFORMATION**
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

# Market Summary

**STEEL SUPPLY**— Uncertainty with respect to steel supplies over the remainder of the year and into the first quarter of next year is mounting in step with expanding voluntary allocations under government sponsorship.

The outlook for the run-of-mine consumer without allocations protection is especially disconcerting in sheets, plates and bars. Sheets and strip, in greatest supply stringency since the end of the war, furnish the bulk of tonnage going into consumer goods so that reduced quotas for the last quarter may force cutbacks in manufacturing schedules, including automobiles.

**CONSUMER QUOTAS**— The steel mills are being forced to trim consumers' quotas not only because of rising preference program requirements, but because carryover tonnage from third quarter will limit new commitments against fourth quarter production.

While allocations are rarely scheduled beyond October, consumer quotas will vary among the mills with reductions from the current quarter approaching 20 per cent in some cases and averaging, overall, close to 10 per cent. In effect producers are being forced to month-to-month scheduling.

**1949 OUTLOOK**— With steel demand far in excess of supply and confusion in the market resulting from the impact of higher prices coupled with f.o.b. mill pricing, steel men are increasingly uncertain as to next year. Higher prices for finished consumer goods with better supply of these products available, growing price resistance by ultimate buyers, and tightening credit controls are factors being given more consideration in sizing up 1949 buying prospects. However, none of these has yet reached the mill level, as evidenced by unabated demand for steel. Meanwhile, the view is advanced in some quarters that many fabricators may be pressing for steel tonnage which they may not immediately need as a means of protecting themselves against even tighter supply conditions later when preference allocations siphon off tonnage in larger volume than at present. Expectations are steel demand will continue in excess of supply for months to come. In this connection unconfirmed reports were circulating in the trade last week to the effect a large manufacturer of consumer goods was seeking to acquire a steel plant in Youngstown.

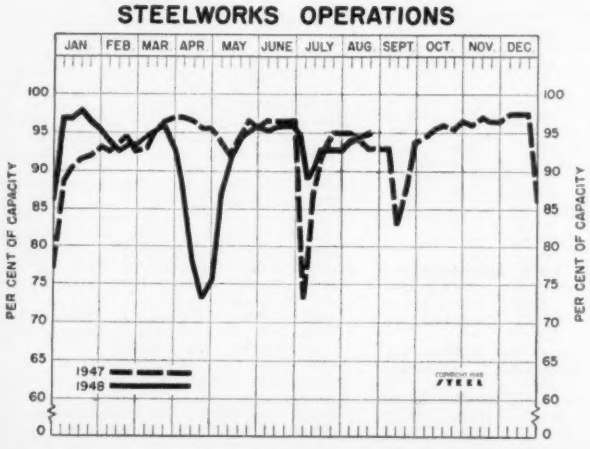
**RAW MATERIALS**— The tight pig iron market was thrown into further turmoil last week when Republic Steel Corp. announced it may be compelled to abandon northern merchant iron sales as result of leasing by the War Assets Administration to the Kaiser-Frazer Corp. of a government blast furnace at Cleveland which Republic has been operating. Over 400 foundries receiving iron from Republic will be affected in event the deal goes through.

Scrap market conditions continue unchanged with supplies limited but prices holding fairly well at established levels. With respect to foundry scrap prices still are tending upward. Last week some cheer was thrown into the market by reports European scrap was beginning to move to this country.

**PRICES**— For the moment steel prices have flattened out at the higher levels recently announced. With the exception of a few belated adjustments by seperate producers the market is without feature price-wise. Last week Lukens Steel Co. announced a new schedule on clad plates. Connellsville furnace coke was advanced 50 cents per ton, and one pig iron producer effected an increase of $2.65 per ton, which maintained its spread over the market in general. Spiegeleisen advanced $5 a ton.

STEEL's arithmetical price composite held unchanged and compared with those for the like week of 1947 as follows: Finished steel, $93.55 and $75.41; semifinished steel, $74.85 and $56.80; steelmaking pig iron, $43.86 and $36.56; steelmaking scrap, $43.33 and $37.91.

## STEELWORKS OPERATIONS




## DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

| | Week Ended Aug. 21 | Change | Same Week 1947 | Same Week 1946 |
|---|---|---|---|---|
| Pittsburgh | 94 | + 0.5 | 95 | 97 |
| Chicago | 94 | + 3 | 90.5 | 92.5 |
| Eastern Pa. | 91 | None | 93 | 81 |
| Youngstown | 103 | None | 92 | 88 |
| Wheeling | 93 | — 2.5 | 89 | 85 |
| Cleveland | 97 | + 8.5 | 93 | 90 |
| Buffalo | 101.5 | None | 88.5 | 86 |
| Birmingham | 100 | None | 99 | 93 |
| New England | 83 | — 2 | 92 | 86 |
| Cincinnati | 102 | + 3 | 87 | 84 |
| St. Louis | 80 | + 2 | 82 | 54.5 |
| Detroit | 99 | — 1 | 88 | 86 |
| Estimated national rate | 95 | + 0.5 | 93 | 89 |

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

# COMPOSITE MARKET AVERAGES

## Arithmetical Price Composites*

| | Aug. 21 | Aug. 14 | Month Ago July 1948 | Year Ago Aug. 1947 | 5 Years Ago Aug. 1943 |
|---|---|---|---|---|---|
| Finished Steel | $93.55 | $93.55 | $85.58 | $75.41 | $56.73 |
| Semifinished Steel | 74.85 | 74.85 | 71.11 | 56.80 | 36.00 |
| Steelmaking Pig Iron | 43.86 | 43.86 | 41.42 | 36.06 | 23.00 |
| Steelmaking Scrap | 43.33 | 43.33 | 41.43 | 39.00 | 19.17 |

**FINISHED STEEL WEIGHTED COMPOSITE†**

| | |
|---|---|
| July 1948 | 3.79216c |
| June 1948 | 3.57740c |
| July 1947 | 3.20098c |
| July 1943 | 2.45880c |

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

**†FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. July, 1948, figure is preliminary.

# COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

## Finished Materials

| | Aug. 21, 1948 | July 1948 | May 1948 | Aug. 1947 |
|---|---|---|---|---|
| Steel bars, Pittsburgh mills | 3.45c | 3.105c | 2.875c | 2.90c |
| Steel bars, del. Philadelphia | 3.79 | 3.545 | 3.365 | 3.28 |
| Steel bars, Chicago mills | 3.35 | 3.065 | 2.875 | 2.90 |
| Shapes, Pittsburgh mills | 3.25 | 2.975 | 2.775 | 2.80 |
| Shapes, Chicago mills | 3.25 | 2.965 | 2.775 | 2.80 |
| Shapes, del. Philadelphia | 3.48 | 3.18 | 2.98 | 2.94 |
| Plates, Pittsburgh mills | 3.50 | 3.155 | 2.925 | 2.95 |
| Plates, Chicago mills | 3.40 | 3.115 | 2.925 | 2.95 |
| Plates, del. Philadelphia | 3.71 | 3.41 | 3.21 | 3.15 |
| Sheets, hot-rolled, Pittsburgh mills | 3.275 | 2.975 | 2.775 | 2.80 |
| Sheets, cold-rolled, Pittsburgh | 4.00 | 3.70 | 3.50 | 3.55 |
| Sheets, No. 10 galv., Pittsburgh | 4.40 | 4.10 | 3.90 | 3.90 |
| Sheets, hot-rolled, Gary mills | 3.25 | 2.965 | 2.775 | 2.80 |
| Sheets, cold-rolled, Gary mills | 4.00 | 3.70 | 3.50 | 3.55 |
| Sheets, No. 10 galv., Gary mills | 4.40 | 4.10 | 3.90 | 3.90 |
| Strip, hot-rolled, Pittsburgh mills | 3.275 | 3.140 | 3.05 | 2.80 |
| Strip, cold-rolled, Pittsburgh mills | 4.00 | 3.875 | 3.775 | 3.55 |
| Bright basic, wire, Pittsburgh | 4.15 | 3.965 | 3.725 | 3.675 |
| Wire nails, Pittsburgh mills | 5.15 | 5.25 | 5.125 | 4.25 |
| Tin plate, per base box, Pittsburgh | $6.70 | $6.68 | $6.60 | $5.75 |

## Semifinished

| | | | | |
|---|---|---|---|---|
| Sheet bars, Chicago mills | $67.00 | $62.80 | $60.00 | $53.57 |
| Slabs, Pittsburgh, Chicago | 52.00 | 47.80 | 45.00 | 40.18 |
| Rerolling billets, Pittsburgh | 52.00 | 47.80 | 45.00 | 40.18 |
| Wire rod ⅜ to ¼-inch, Pitts. | 3.45c | 3.419c | 3.175c | 2.925c |

## Pig Iron

| | Aug. 21, 1948 | July 1948 | May 1948 | Aug. 1947 |
|---|---|---|---|---|
| Bessemer, del. Pittsburgh (N.&S. sides) | $44.08 | $44.08 | $41.038 | $37.83 |
| Basic, Valley | 43.00 | 40.60 | 39.00 | 36.00 |
| Basic, eastern del. Philadelphia | 46.17 | 43.77 | 42.17 | 38.72 |
| No. 2 fdry., del. Pgh. (N.&S. sides) | 43.58 | 43.58 | 40.538 | 37.33 |
| No. 2 fdry., del. Philadelphia | 46.67 | 44.27 | 42.67 | 39.22 |
| No. 2 foundry, Chicago | 43.25 | 41.10 | 39.00 | 36.00 |
| No. 2 foundry, Valley | 43.50 | 41.10 | 39.50 | 36.50 |
| Southern No. 2 Birmingham | 43.38 | 40.72 | 38.63 | 34.51 |
| Southern No. 2 del. Cincinnati | 49.09 | 46.43 | 43.90 | 39.38 |
| Malleable, Valley | 43.50 | 40.30 | 39.50 | 36.50 |
| Malleable, Chicago | 43.50 | 41.50 | 39.50 | 36.50 |
| Charcoal, low phos., fob Lyles, Tenn. | 62.00 | 59.60 | 56.50 | 44.00 |
| Ferromanganese, fob cars, Pittsburgh | 148.00* | 151.15 | 151.15 | 140.25 |

*Fob Aetna, Pa.

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melt. steel, No. 1, Pittsburgh | $40.25 | $40.75 | $40.25 | $39.50 |
| Heavy melt. steel, No. 2, E. Pa. | 41.50 | 40.00 | 39.00 | 38.35 |
| Heavy melt. steel, No. 1 Chicago | 41.75 | 40.05 | 39.25 | 39.625 |
| Heavy melt. steel, No. 1 Valley | 42.75 | 40.75 | 40.25 | 40.50 |
| Heavy melt. steel, No. 1, Cleveland | 42.25 | 40.25 | 39.75 | 38.81 |
| Heavy melt. steel, No. 1 Buffalo | 45.50 | 44.30 | 43.00 | 40.88 |
| Rails for rerolling, Chicago | 62.50 | 57.80 | 51.75 | 47.125 |
| No. 1 cast, Chicago | 70.00 | 68.50 | 66.00 | 43.50 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, beehive furnace | $14.50 | $14.25 | $12.94 | $12.00 |
| Connellsville, beehive foundry | 17.00 | 17.00 | 15.06 | 14.50 |
| Chicago, oven foundry, ovens | 19.86 | 20.75 | 18.50 | 18.50 |

# FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

## Semifinished Steel

**Carbon Steel Ingots:** Rerolling quality, standard analysis, open market, $100-105 per gross ton. Forging quality $50 per net ton, mill.

**Alloy Steel Ingots:** $51 per net ton, mill.

**Rerolling Billets, Blooms, Slabs:** $52 per net ton, mill, except $62, Conshohocken, Pa., mill; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

**Forging Quality Billets, Blooms, Slabs:** $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

**Alloy Billets, Slabs, Blooms:** Rerolling quality, $63 per net ton, mill.

**Sheet Bars:** $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

**Skelp:** 3.25c per lb, mill.

**Tube Rounds:** $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

**Wire Rods:** Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester mill; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles mills, 4.15c, Monessen, Pa., mill. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

## Bars

**Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size):** 3.35c, mill, except: 3.55c, Ecorse, Mich., Monessen, Aliquippa, Pa., 3.35-3.55c, Pittsburgh; 4.05c, Pittsburg and Torrance, Calif.; 4.10c, Atlanta, Ga., S. San Francisco, Los Angeles, Niles, Calif., Seattle, Wash., Portland, Oreg.; 5.30c, Fontana, Calif.

**Rail Steel Bars: (Base 10 tons):** 3.35c mill, except: 4.80c, Williamsport, Pa.

**Hot-Rolled Alloy Bars:** 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

**Hot-Rolled Alloy Bar Shapes:** 4.00c, mill.

**Cold-Finished Carbon Bars (Base 20,000-39,999 lb):** 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Mass., Beaver Falls, Pa., Massillon, O.; 4.45c, Camden, N. J.; 5.30 Los Angeles.

**Cold-Finished Alloy Bars:** 4.65c, mill, except: 4.75c, Monessen, Pa., mill; 4.95c, Worcester, Mass., mill.

**High-Strength, Low-Alloy Bars:** 5.10c, mill, except: 5.40c, Ecorse, Mich., mill.

**Reinforcing Bars (New Billet):** To fabricators: 3.35c, mill, except: 3.55c, Monessen, Pa., mill; 4.05c, Pittsburg and Torrance, Calif., mills; 4.10c, Atlanta, Ga., Seattle, S. San Francisco, Los Angeles. To consumers: 4.10c, mill, except: 4.85c, Seattle.

**Reinforcing Bars (Rail Steel):** 4.65c, mill.

**Iron Bars:** Single Refined: 8.60c, (hand puddled), Pittsburgh mill; 9.50c, Economy, Pa., mill. Double Refined: 11.25c (hand puddled), Pittsburgh mill; 11.00c, Economy, Pa., mill. Staybolt: 12.75c, (hand puddled), Pittsburgh mill; 11.30c, Economy, Pa., mill.

**Hot-Rolled Ingot Iron Bars:** 3.60c, mill.

## Sheets

**Hot-Rolled Sheets (18 gage and heavier):** 3.25c, mill, except: 3.25-3.30c, Pittsburgh, Cleveland; 3.45c, Ecorse, Mich.; 3.95c, Pittsburg, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.

**Hot-Rolled Sheets (19 gage and lighter, annealed):** 4.15c, mill, except: 4.65c, Niles, O., mill; 5.05c, Torrance, Calif.

**Cold-Rolled Sheets:** 4.00c, mill, except: 4.20c, Granite City, Ill., and Ecorse, Mich., mills; 4.95c, Pittsburg, Calif., mill.

**Galvanized Sheets, No. 10: (Based on 5 cent zinc)** 4.40c, mill, except: 4.60c; 5.00c, Niles, O., mill; 5.15c, Pittsburgh and Torrance, Calif.

**Galvannealed Sheets:** 4.95c, mill, except: 5.55c, Niles, O., mill.

**Culvert Sheets, No. 16 flat (based on 5-cent zinc)** 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburg and Torrance, Calif. Copper-iron: 5.74c mill.

**Aluminized Sheets:** Hot-dipped, coils or cut to lengths: 7.75c, mill.

**Long Ternes, No. 10 (Commercial quality):** 4.80c, mill.

**Long Ternes Ingot Iron:** 5.20c, mill.

**Enameling Sheets, No. 12:** 4.40c, mill, except: 4.60c, Granite City, Ill., mill; 4.70c, Ecorse, Mich., mill; 6.00c, Niles, O., mill.

**Silicon Sheets, No. 24: Field:** 5.15c, mill. Armature: 5.45c, mill, except: 5.65c, Granite City, Ill., mill; 6.05c, Niles, O., mill. Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City, Ill., mill; 6.55c, Niles, O., mill. Cold-rolled, 6.20c, mill. Motor: 6.70, mill, except: 6.90c, Granite City, Ill., mill; 7.20c, Brackenridge, Pa., mill. Dynamo; 7.50c, mill, except: 7.40c, Follansbee, W. Va., Toronto, O., mills; 7.70c, Granite City, Ill., mill; 7.90c Brackenridge, Pa., mill. Transformer 72, 8.05c, mill, except: 7.90c, Follansbee, W. Va., Toronto, O., mills; 8.90c, Brackenridge, Pa., mill. 65, 8.65c, mill, except: 8.60c, Follansbee, W. Va., Toronto, O., mills; 9.60c, Breckenridge ,Pa., mill. 58, 9.30c, mill, except: 10.30c, Brackenridge, Pa., mill. 52, 10.10c, mill.

**High-Strength Low-Alloy Sheets:** Hot-rolled, 4.95c,mill, except: 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

**Ingot Iron Sheets (18 gage and heavier):** Hot-rolled, 3.50c, mill Cold-rolled, 4.50c, mill. Galvanized, 4.65c, mill, except: 4.95c, Indiana Harbor, Ind., mill.

## Strip

**Hot-Rolled Strip:** 3.25c, mill, except: 3.25-3.30c, Chicago, Cleveland, Pittsburgh; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich., Atlanta, Ga.; 3.60c, Detroit; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, Wash., S. San Francisco, Los Angeles; 5.90c, Fontana, Calif.

*6-in. and narrower; wider than 6-in., respectively.

**Cold-Rolled Strip (0.25 carbon and less):** 4.00c, mill, except: 4.00-4.25c, Chicago; 4.20c, Ecorse, Mich.; 4.25c, Warren, O.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa.; 4.75c, Dover, O.; 5.75c, Los Angeles; 7.10c, Fontana, Calif.

**Hot-Rolled Alloy:** 5.10c, mill.

**Cold-Rolled Alloy Strip:** 9.50c, mill, except 9.80c, Worcester, Mass., mill.

**Cold-Finished Spring Steel:** 0.26-0.40 carbon, 4.00c, mill; over 0.40 to 0.60 carbon, 5.50c, mill; over 0.60 to 0.80 carbon, 6.10c; over 0.80 to 1.05, 8.05c; over 1.05 to 1.35, 10.35c; add 0.30c for Worcester mill.

**High-Strength, Low-Alloy Strip:** Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

## Tin, Terne Plate

**Tin Plate: American Coke,** per base box of 100 lb, 1.25 lb coating $6.60-$6.80; 1.50 lb coating $6.80-$7.00. Pittsburg, Calif., mill $7.35 and $7.55, respectively, for 1.25 and 1.50 lb coatings.

**Electrolytic Tin Plate:** Per base box of 100 lb, 0.25 lb tin, $5.80-$6.00; 0.50 lb tin, $6.00-$6.20; 0.75 lb tin, $6.20-$6.40.

**Can Making Black Plate:** Per base box of 100 lb, 55 to 70 lb basis weight, $5.20-$5.30; 75 to 95 lb basis weight, $5.10-$5.20; 100 to 128 lb basis weight, $5.20-$5.30.

**Hollowware Enameling Black Plate:** 29-gage, 4.75-4.95c per lb.

**Manufacturing Ternes (Special Coated):** Per base box of 100 lb, $5.90-$6.10. Granite City, $6.

**Roofing Ternes:** Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

## Plates

**Carbon Steel Plates:** 3.40c, mill, except: 3.40-3.60c. Pittsburgh, Cleveland; 3.45c, Sparrows Point, Md.; 3.60c, Aliquippa, Pa.; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.80c, Seattle; 5.80c, Fontana, Calif.; 5.85c, Harrisburg, Pa.

**Floor Plates:** 4.55c, mill.

**Open-Hearth Alloy Plates:** 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

**High-Strength, Low-Alloy Plates:** 5.20c mill, except: 5.10c, Coatesville, Pa., mill; 5.30c, Conshohocken, Pa., Sparrows Point, Md., and Johnstown, Pa., mills; 5.65c, Ecorse, Mich.

## Shapes

**Structural Shapes:** 3.25c, mill, except 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa., 3.85c, Torrance, Calif.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

**Beams, Wide Flange:** 3.20c, mill, except: 3.30c, Bethlehem, Aliquippa, Pa. mills.

**Alloy Structural Shapes:** 4.05c, mill.

**Steel Sheet Piling:** 4.05c, mill.

**High-Strength, Low-Alloy Shapes:** 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., and Lackawanna, N. Y., mills.

## Wire and Wire Products

**Wire to Manufacturers (carloads):** Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.00c, Atlanta, Ga., mill; 4.25c, Sparrows Point, Md., mill; 4.45c, Worcester, Mass., mill; 4.50c, Monessen, Pa., mill; 4.70c, Portsmouth, O., mill; 5.10c, Pittsburg, Calif., mill.

**Basic MB Spring Wire,** 5.55c, mill, except: 5.65c, Sparrows Point, Md., Monessen, Pa., mills; 5.85c, Worcester, Mass., Trenton, N. J., mills; 6.50c, Pittsburg, Calif., mill.

**Upholstery Spring Wire,** 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa., mills; 5.50c, Worcester, Mass., Trenton, N. J. New Haven, Conn., mills; 6.15c, Pittsburg, Calif., mill.

**Wire Products to Trade (carloads): Merchant Quality Wire:** Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90, Sparrows Point, Md., mill; 4.95c, Monessen, Pa., mill; 5.10c, Worcester, Mass., mill; 5.20c, Atlanta, Ga., mill; 5.75c, Pittsburg, Calif., mill. Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md., mill; 5.40c, Monessen, Pa., mill; 5.55c, Worcester, Mass., mill; 5.65c, Atlanta, Ga., mill; 6.20c, Pittsburg, Calif., mill.

**Nails and Staples:** Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 103-124, Cleveland; 105, Sparrows Point, Md.; 109 Worcester, Mass.; 110 Atlanta, Ga.; 117, Portsmouth, O; 123, Pittsburg, Calif; 126, Monessen, Pa.; $4.77 per 100 lb, Williamsport, Pa.; $5.20 per 100 pound keg, Aliquippa, Pa.; $6.75, Conshohocken, Pa., and Wheeling, W. Va.

**Woven Fence** (9 to 15½ Gage, inclusive): Column 109, mill, except: 113 Monessen, Pa., mill; 121 Atlanta, Ga., mill; 132, Pittsburg, Calif., mill.

**Barbed Wire:** Column 123 mill, except: Column 125, Sparrows Point, Md., mill; 126 Atlanta, Ga., mill; 128 Monessen, Pa., mill; 143, Pittsburg, Calif., mill.

**Fence Posts (with clamps):** Column 114, Duluth; Column 115, Johnstown, Pa.; $123.50 per net ton, Williamsport, Pa.

**Bale Ties** (single loop): Column 106, mill, except: 108, Sparrows Point, Md., mill; 110, Atlanta, G., mill; 130, Pittsburg, Calif., mill.

## Tubular Goods

**Standard Steel Pipe:** Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

| | Butt Weld | | | | |
|---|---|---|---|---|---|
| In. | Blk. | Gal. | In. | Blk. | Gal. |
| ⅛ | 41½ | 14 | 1¼ | 49 | 33 |
| ¼ | 39½ | 16½ | 1½ | 49½ | 33½ |
| ⅜ | 36 | 12 | 2 | 49–50 | 33–34 |
| ½ | 43 | 25½ | 2½, 3 | 49½–50½ | 33½–34½ |
| ¾ | 46 | 29½ | | | |
| 1 | 48½ | 32½ | 3½ & 4 | 44½ | 28 |

| | Lap Weld | | Elec. Weld | | Seamless | |
|---|---|---|---|---|---|---|
| In. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| 2 | 39½ | 23 | 39 | 22½ | 27–38½ | 10½–22 |
| 2½ | 42½–43½ | 26–27 | 42 | 25½ | 32½–41½ | 16–25 |
| 3 | 42½–43½ | 26–27 | 42 | 25½ | 35–41½ | 18½–25 |
| 3½ & 4 | 44½–46½ | 28–30 | 44 | 27½ | 38½–43½ | 22–27 |
| 5-6 | 44½ | 28 | 44 | 27½ | 38½–43½ | 22–27 |
| 7 | .. | .. | .. | .. | 43½ | 26 |

**Line Steel Pipe:** Mill prices in carlots to consumers about $200 a net ton.

| | Butt Weld | | | Butt Weld | |
|---|---|---|---|---|---|
| In. | Blk. | Gal. | In. | Blk. | Gal. |
| ⅛ | 40½ | ... | 1¼ | 48 | 32 |
| ¼ | 38½ | ... | 1½ | 48½ | 32½ |
| ⅜ | 35 | ... | 2 | 48–49 | 32 |
| ½ | 42 | 24½ | 2½ & 3 | 48½–49½ | 32½ |
| ¾ | 45 | 28½ | 3½ & 4 | 43½ | |
| 1 | 47½ | 31½ | | | |

| | Lap Weld | | Elec. Weld | | Seamless | |
|---|---|---|---|---|---|---|
| In. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| 2 | 38½ | 22 | 38 | .. | 26–37½ | 9½ |
| 2½ | 41½–42½ | 26 | 41 | .. | 31½–40½ | 15 |
| 3 | 41½–42½ | 26 | 41 | .. | 34–40½ | 17½ |
| 3½-6 | 43½–45½ | 29 | 44 | .. | 37½–42½ | 21 |
| 8 | 45½ | .. | 46 | .. | 40½–44½ | 23 |
| 10 | 45 | .. | 45½ | .. | 41½–44 | 24 |
| 12 | 44 | .. | 44½ | .. | 40½–43 | 23 |

**Standard Wrought Iron Pipe:** Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

| | Butt Weld | | | Lap Weld | |
|---|---|---|---|---|---|
| In. | Blk. | Gal. | In. | Blk. | Gal. |
| ⅜ | +59½ | +89 | 1¼ | +22 | +46½ |
| ½ | +20½ | +46 | 1½ | +15½ | +39 |
| ¾ | +10½ | +35 | 2 | + 7½ | +30 |
| 1 and 1¼ | + 4½ | +26 | 2½-3½ | + 5 | +25.5 |
| 1½ | — 1½ | +22½ | 4 | List | +19½ |
| 2 | — 2 | +22 | 4½-8 | + 2 | +21 |
| | | | 9-12 | +12 | +30½ |

**Boiler Tubes:** Net base c.l. prices, dollars per 100′, mill; minimum wall thickness, cut lengths 4 to 24″, inclusive.

| | | ——Seamless—— | | —Elec. Weld— | |
|---|---|---|---|---|---|
| O.D. In. | B.W. Ga. | Hot Rolled | Cold Drawn | Hot Rolled | Cold Drawn |
| 1 | 13 | .... | 13.39 | 13.00 | 13.00 |
| 1¼ | 13 | .... | 15.87 | 13.21 | 15.39 |
| 1½ | 13 | $15.05 | 17.71 | 14.60 | 17.18 |
| 1¾ | 13 | 17.11 | 20.15 | 16.60 | 19.54 |
| 2 | 13 | 19.18 | 22.56 | 18.60 | 21.89 |
| 2¼ | 13 | 21.37 | 25.16 | 20.73 | 24.40 |
| 2½ | 12 | 23.54 | 27.70 | 22.83 | 26.88 |
| 2½ | 12 | 25.79 | 30.33 | 25.02 | 29.41 |
| 2¾ | 12 | 27.33 | 32.14 | 26.51 | 31.18 |
| 3 | 12 | 28.68 | 33.76 | 37.82 | 32.74 |
| 3¼ | 11 | 33.39 | 39.29 | 32.39 | 38.11 |
| 3½ | 11 | 35.85 | 42.20 | 34.78 | 40.94 |
| 4 | 10 | 44.51 | 52.35 | 43.17 | 50.78 |
| 4½ | 9 | 58.99 | 69.42 | .... | .... |
| 5 | 9 | 68.28 | 80.35 | .... | .... |
| 6 | 7 | 104.82 | 123.33 | .... | .... |

## Rails, Supplies

**Rails:** Standard, over 60-lb: $3.20 per 100 lb, mill.

**Light** (billet): $3.55 per 100 lb, mill.

**Light** (rail steel): $4.70 per 100 lb., Williamsport, Pa.

**Relaying,** 60 lb and over: $60-$65 per net ton, f.o.b. warehouse.

**Railroad Supplies:** Track bolts, treated: $8.50 per 100 lb., mill. Untreated: $8.25, mill, except: $7.50, Fairfield, Ala., mill.

**Tie Plates:** 4.05c mill, except: 4.20c, Pittsburg, Calif.; 4.50c, Seattle, mill.

**Splice Bars:** 4.25c, mill.

**Standard Spikes:** 5.35c, mill, except: 5.25c, Pittsburgh mill.

**Axles:** 5.20c, mill.

## Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

**Carriage and Machine Bolts**

| | |
|---|---|
| ½-in. and smaller; up to 6 in. in length | 35 off |
| ⅝ and ⅝ x 6-in. and shorter | 37 off |
| ¾-in. and larger x 6-in. and shorter | 34 off |
| All diameters longer than 6-in. | 30 off |
| Tire bolts | 25 off |
| Plow bolts | 47 off |
| Lag bolts, 6 in. and shorter | 37 off |
| Lag bolts, longer than 6 in. | 35 off |

**Stove Bolts**

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

**Nuts**

| Semifinished hexagon | A.S. Light | A.S. Reg. and Heavy |
|---|---|---|
| ⅞-in. and smaller | 41 off | ..... |
| ½-in. and smaller | ..... | 38 off |
| ½-in.-1-in. | 39 off | ..... |
| ⅝-in.-1-in. | ..... | 37 off |
| 1⅛-in.-1½-in. | 37 off | 35 off |
| 1⅝-in. and larger | ..... | 28 off |

Additional discount of 15 for full containers.

**Hexagon Cap Screws (Packaged)**

| | |
|---|---|
| Upset 1-in. smaller by 6-in. and shorter (1020 bright) | 46 off |
| Upset (1035 heat treated) | |
| ⅝ and smaller x 6 and shorter | 40 off |
| ¾, ⅞, & 1 x 6 and shorter | 35 off |

**Square Head Set Screws**

| | |
|---|---|
| Upset 1-in. and smaller | 51 off |
| Headless, ¼-in. and larger | 31 off |

## Rivets

F.o.b. midwestern plants,

| | |
|---|---|
| Structural ½-in. and larger | 6.75c |
| ⅞-in. and under | 48 off |

## Washers, Wrought

**Fob Pitts., Chicago, Philadelphia, to jobbers and large nut and bolt mfrs.....$1-$2 off**

## Tool Steels

**Tool Steel:** Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

| W | Cr | V | Mo | Co | Base Per lb |
|---|---|---|---|---|---|
| 18 | 4 | 1 | ... | ... | 90.50c |
| 18 | 4 | 2 | ... | ... | 102.5c |
| 18 | 4 | 3 | ... | ... | 114.5c |
| 18 | 4 | 2 | ... | 9 | 168.5c |
| 1.5 | 4 | 1 | 8.5 | ... | 65.00c |
| 6.4 | 4.5 | 1.9 | 5 | ... | 69.50c |
| 6 | 4 | 3 | 6 | ... | 88.00c |

## Stainless Steels

Mill prices, cents per lb. New price schedules pending.

**CHROMIUM NICKEL STEELS**

| Grade | Bars, Wire, Shapes | Plate | Sheets | Hot Rolled Strip | Cold Rolled Strip |
|---|---|---|---|---|---|
| 301 | 28.75 | 32.50 | 40.75 | 24.25 | 32.00 |
| 302 | 28.75 | 32.50 | 40.75 | 25.75 | 33.75 |
| 303 | 31.50 | 34.75 | 43.00 | 32.50 | 39.75 |
| 304 | 31.25 | 34.75 | 43.00 | 28.00 | 35.75 |
| 308 | 34.75 | 40.75 | 49.00 | 34.00 | 43.00 |
| 309 | 43.00 | 48.00* | 56.25 | 44.00 | 56.25 |
| 310 | 59.00 | 62.25† | 63.25 | 52.25 | 57.25 |
| 316 | 48.00 | 53.00 | 57.25 | 47.85 | 57.25 |
| 317 | 60.00 | 64.50 | 69.50 | .... | 39.50 |
| 321 | 34.75 | 40.75 | 49.00 | 35.25 | 45.75 |
| 347 | 39.75 | 45.75 | 54.00 | 39.50 | 50.25 |
| 403 | 26.00 | 29.75 | 35.25 | .... | 32.50 |
| 405 | 24.25 | 27.50 | 33.75 | .... | 32.00 |

**STRAIGHT CHROMIUM STEEL**

| | | | | | |
|---|---|---|---|---|---|
| 410, 414 | 22.75 | 26.00 | 32.00 | 20.25 | 26.50 |
| 416 | 23.25 | 26.50 | 32.50 | 22.00 | 28.25 |
| 420 | 28.75 | 34.25 | 40.25 | 28.50 | 43.50 |
| 430 | 23.25 | 26.50 | 34.75 | 21.00 | 27.00 |
| 430F | 23.75 | 27.00 | 35.25 | 22.50 | 29.75 |
| 431 | 23.25 | 26.50 | 34.75 | .... | 27.00 |
| 440A, B, C | 28.75 | 34.25 | 40.25 | .... | 43.50 |
| 442 | 27.00 | 31.00 | 39.25 | .... | 38.50 |
| 446 | 33.00 | 36.50 | 46.50 | .... | 62.25 |
| 501§ | 10.00 | 14.50 | 19.25 | 14.25 | 20.50 |
| 502§ | 11.00 | 16.00 | 20.50 | 16.00 | 21.50 |

§ Low chromium.

# RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

## Pig Iron

Per Gross Ton

| | Basic | No. 2 Foundry | Malleable | Bessemer |
|---|---|---|---|---|
| **Bethlehem, Pa.,** furnace | $44.00 | $44.50 | $45.00 | $45.50 |
| Newark, N. J., del. | 46.39 | 46.89 | 47.39 | 47.89 |
| Brooklyn, N. Y., del. | .... | 48.40 | 48.90 | .... |
| Philadelphia, del. | 46.17 | 46.67 | 47.17 | 47.67 |
| **Birmingham,** furnace | 42.88 | 43.38 | .... | .... |
| Cincinnati, del. | .... | 49.09 | .... | .... |
| **Buffalo,** furnace | 44.00 | 44.00 | 44.50 | 45.00 |
| Boston, del. | 52.42 | 52.42 | 52.92 | .... |
| Rochester, del. | 46.22 | 46.22 | 46.72 | 47.22 |
| Syracuse, del. | 47.025 | 47.025 | 47.525 | 48.025 |
| **Chicago,** furnace | 42.50-43.00 | 43.00-43.50 | 43.50 | 44.00 |
| Milwaukee, del. | 44.22-44.72 | 44.72-45.22 | 45.22 | 45.72 |
| Muskegon, Mich., del. | .... | 49.65-50.15 | 50.15 | .... |
| **Cleveland,** furnace | 43.00 | 43.50 | 43.50 | 44.00 |
| Akron, del. | 45.17 | 45.67 | 45.67 | 46.17 |
| **Duluth,** furnace | 43.00 | 43.50 | 44.00 | 44.50 |
| **Erie, Pa.,** furnace | 42.50 | 43.00 | 43.50 | 44.00 |
| **Everett, Mass.,** furnace | .... | 48.75 | 49.25 | .... |
| **Geneva, Utah,** furnace | 43.00 | 43.50 | .... | .... |
| Seattle, Tacoma, Wash., del. | .... | 50.63 | .... | .... |
| Portland, Oreg., del. | .... | 50.63 | .... | .... |
| Los Angeles, San Francisco | 50.13 | 50.63 | .... | .... |
| **Granite City, Ill.,** furnace | 47.90 | 48.40 | 48.90 | .... |
| St. Louis, del. | 48.65 | 49.15 | 49.65 | .... |
| **Ironton, Utah,** furnace | .... | 43.50 | .... | .... |
| **‡Neville Island, Pa.,** furnace | 46.00 | 46.50 | 46.50 | 47.00 |
| Pittsburgh, del., N.&S. Sides | 47.08 | 47.58 | 47.58 | 48.08 |
| **Pittsburgh (Carnegie),** furnaces | 43.00 | 43.50 | 43.50 | 44.00 |
| **Sharpsville, Pa.,** furnace | 43.00 | 43.50 | 43.50 | 44.00 |
| **Steelton, Pa.,** furnace | 44.00 | 44.50 | 45.00 | 45.50 |
| **Struthers, O.,** furnace | 42.50 | .... | .... | .... |
| **Swedeland, Pa.,** furnace | 50.00 | 50.50 | 51.00 | .... |
| **Toledo, O.,** furnace | 42.50 | 43.00 | 43.50 | 44.00 |
| Cincinnati, del. | 47.05 | 47.55 | .... | .... |
| **Youngstown, O.,** furnace | 43.00 | 43.50 | 43.50 | 44.00 |
| Mansfield, O. | 46.87 | 47.37 | 47.37 | 47.87 |

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

### Blast Furnace Silvery Pig Iron

| | | | |
|---|---|---|---|
| 6.00-6.50 per cent Si (base) | $56.50 | | |
| 6.51-7.00 | 57.75 | 9.01- 9.50 | 64.00 |
| 7.01-7.50 | 59.00 | 9.51-10.00 | 65.25 |
| 7.51-8.00 | 60.25 | 10.01-10.50 | 66.50 |
| 8.01-8.50 | 61.50 | 10.51-11.00 | 67.75 |
| 8.51-9.00 | 62.75 | 11.01-11.50 | 69.00 |

Fob Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

### Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

**Electric Furnace Silvery Pig Iron** Si 14.01-14.50%, $81.75 furnace, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

### Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$62 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

### Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $50. Philadelphia $52.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $48.00.

### Differentials

Prices are subject to following differentials:

**Silicon:** An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

**Phosphorus:** A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

**Manganese:** An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

**Nickel:** An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

## Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective $CaF_2$ content, 70% or more, $35; less than 60% $32.

## Metallurgical Coke

Price per Net Ton

### Beehive Ovens

| | |
|---|---|
| Connellsville, furnace | $13.50-15.50 |
| Connellsville, foundry | 16.00- 18.00 |
| New River, foundry | 16.50 |
| Wise county, foundry | 15.35 |
| Wise county, furnace | 14.60 |

† Nominal.

### Oven Foundry Coke

| | |
|---|---|
| Kearney, N. J., ovens | $21.50 |
| Chicago, ovens | 20.40 |
| Terre Haute, ovens | 21.00 |
| Milwaukee, ovens | 21.15 |
| New England, del. | 22.75 |
| Birmingham, del. | 17.86 |
| Indianapolis, ovens | 20.85 |
| Cincinnati, del. | 21.40 |
| Ironton, O., ovens | 18.25 |
| Erie, Pa., del. | 22.45 |
| Painesville, O., ovens | 20.90 |
| Cleveland, del. | 22.45 |
| Buffalo, del. | 23.10 |
| Detroit, del. | 21.65 |
| Philadelphia, ovens | 20.55 |
| Swedeland, Pa., ovens | 20.50 |
| Portsmouth, O., ovens | 19.25 |

## Coal Chemicals

Spot, cents per gallon, ovens

(Price effective as of Aug. 5)

| | |
|---|---|
| Pure benzol | 20.00 |
| Toluol, one degree | 20.50-26.50 |
| Toluol, two degrees | 23.00-26.50 |
| Industrial xylol | 20.50-26.50 |

Per pound, ovens

| | |
|---|---|
| Phenol, 40 (car lots, returnable drums) | 13.00 |
| Do., less than carlots | 13.75 |
| Do., tank cars | 12.00 |
| Naphthalene flakes, balls, bbl. to jobbers, "household use" | 12.00 |

Per ton, bulk, ovens

| | |
|---|---|
| Sulphate of ammonia | $45.00 |

## Refractories

(Prices per 1000 brick, fob plant)

### Fire Clay Brick

Super Duty: St. Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty; St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

### Ladle Brick

Dry Press: $50.
Wire Cut: $48.

### Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

### Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

### Basic Brick

(Base prices per net ton f.o.b. works, Baltimore or Chester, Pa.)

Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

### Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)

Domestic dead-burned, ¾" grains; Bulk, $31; single paper bags, $35.50.

### Dolomite

(Base prices per net ton)

Domestic, dead-burned, bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

## Ores

### Lake Superior Iron Ore

*Gross ton, 51½% (natural) Lower Lake Ports*

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

| | |
|---|---|
| Old range bessemer | $6.60 |
| Old range nonbessemer | 6.45 |
| Mesabi bessemer | 6.35 |
| Mesabi nonbessemer | 6.20 |
| High phosphorus | 6.20 |

### Eastern Local Ore

*Cents, units, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56.62% contract | 15.25 |

### Foreign Ore

*Cents per unit, cif Atlantic ports*

| | |
|---|---|
| Swedish basic, 60 to 68% | 14.50 |
| Brazil iron ore, 68-69% | 18.50 |

### Tungsten Ore

| | |
|---|---|
| Wolframite and scheelite per short ton unit, duty paid | $26-$28 |

### Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

### Chrome Ore

*Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)*

| | |
|---|---|
| **Indian and African** | |
| 48% 2.8:1 | $37.50 |
| 48% 3:1 | 39.00 |
| 48% no ratio | 31.00 |
| **South African (Transvaal)** | |
| 44% no ratio | $25.50-$26.00 |
| 45% no ratio | 26.50 |
| 48% no ratio | 29.00-30.00 |
| 50% no ratio | 29.50-30.50 |
| **Brazilian—nominal** | |
| 44% to 2.5:1 lump | $33.65 |
| **Rhodesian** | |
| 45% no ratio | $27-$27.50 |
| 48% no ratio | 30.00 |
| 48% 3:1 lump | 39.00 |
| **Domestic (seller's nearest rail)** | |
| 48% 3:1 | $39.00 |

### Molybdenum

| | |
|---|---|
| Sulphide conc., lb., Mo., cont., Mines | $0.75 |

# WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

| | SHEETS | | | STRIP | | BARS | | | | PLATES | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | H-R 10 Ga. | C-R 17 Ga. | Gal. *10 Ga. | †H-R | †C-R | H-R Rds. ⅜" to 3" | C-F Rds. ½" & up | H-R Alloy **4140 | Standard Structural Shapes | Carbon ⅜"-¾" | Floor ⅜" & Thicker |
| Boston (city) | 5.84 | 6.64 | 7.84 | 6.04 | 6.90 | 5.69 | 6.39 | 8.24 | 5.54 | 5.89 | 7.34 |
| Boston (c'try) | 5.69 | 6.49 | 7.69 | 5.89 | ... | 5.54 | 6.24 | 8.09 | 5.39 | 5.74 | 7.19 |
| New York (city) | 5.73-5.80 | 6.73 | 7.74-7.83 | 6.08-6.28 | ... | 5.83 | 6.58 | 8.22 | 5.52-5-78 | 5.98 | 7.48 |
| New York (c'try) | 5.53-5.60 | 6.53 | 7.54-7.63 | 5.88-6.08 | ... | 5.63 | 6.38 | ... | 5.32-5.58 | 5.78 | 7.28 |
| Phila. (city) | 5.50-5.86 | 6.61-6.81 | 7.42-7.62 | 5.60 | ... | 5.57-5.65 | 6.31 | 7.94 | 5.24-5.35 | 5.52-5.65 | 7.16 |
| Phila. (c'try) | 5.35-5.71 | 6.46-6.66 | 7.27-7.47 | 5.45 | ... | 5.42-5.50 | 6.16 | 7.79 | 5.09-5.20 | 5.37-5.50 | 7.01 |
| Balt. (city) | 5.43† | 6.33 | 7.53 | 5.49 | ... | 5.54 | ... | ... | 5.48 | 5.68 | 7.13 |
| Balt. (c'try) | 5.28† | 6.18 | 7.38 | 5.34 | ... | 5.39 | ... | ... | 5.33 | 5.33 | 6.98 |
| Norfolk, Va. | 5.75 | ... | ... | ... | ... | 6.00 | 7.00 | ... | 6.00 | 6.00 | 7.50 |
| Buffalo (city) | 5.25 | 6.00[5] | 7.75 | 5.70 | ... | 5.35 | 6.05 | ... | 5.25 | 5.61 | ... |
| Buffalo (c'try) | 5.10 | 5.85[5] | 7.60 | 5.55 | ... | 5.20 | 5.90 | ... | 5.10 | 5.46 | ... |
| Pitts. | 4.85-5.00§ | 5.75-5.85[5] | 7.00-7.05 | 5.00-5.35 | 5.95-6.00 | 4.90-5.10 | 5.65 | 7.65 | 4.90-5.15 | 5.05-5.25 | 6.55 |
| Detroit | 5.40§ | 6.30 | 7.60 | 5.40 | ... | 5.45 | 6.17 | 8.12 | 5.45 | 5.65 | 7.10 |
| Cleveland (city) | 5.13-5.75[23] | 5.75-6.04† | 7.33-7.85[23] | 5.02-5.69 | ... | 5.19-5.34† | 5.95-6.05† | 7.94 | 5.19-5.57 | 5.39-5.54† | 6.84-6.99† |
| Cleveland (c'try) | 4.98 | 5.85 | 7.18 | 5.54 | ... | 5.19† | 5.90† | 7.79 | 5.42 | 5.39† | 6.84† |
| Cincinnati | 5.26 | 6.11 | 7.60 | 5.52 | 6.07 | 5.52 | 60.7 | ... | 5.37 | 5.61 | 6.91 |
| Chicago (city) | 5.20 | 5.90‡[5] | 7.20 | 5.00 | 6.30 | 5.05 | 5.85 | 7.80[9] | 5.05 | 5.25 | 6.70 |
| Chicago (c'try) | 5.05 | 5.75‡[5] | 7.05 | 4.85 | 6.15 | 4.90 | 5.70 | 7.65[9] | 4.90 | 5.10 | 6.55 |
| Milwaukee (city) | 5.37 | 6.07‡[5] | 7.37 | 5.17 | 6.47 | 5.22 | 6.02 | 7.97[9] | 5.22 | 5.42 | 6.87 |
| St. Louis | 5.19§ | 6.09[5] | 7.29 | 5.19 | 6.49 | 5.24 | 6.04[12] | 9.49 | 5.24 | 5.44 | 6.89 |
| Birm'ham (city) | 5.20§ | ... | 6.60 | 5.20 | ... | 5.15 | 6.66 | ... | 5.15 | 5.40 | 7.41 |
| Birm'ham (c'try) | 5.05§ | ... | 6.45 | 5.05 | ... | 5.00 | 6.51 | ... | 5.00 | 5.25 | 7.26 |
| Omaha, Nebr. | 6.07 | ... | 9.33 | 6.07 | ... | 6.12 | 6.92 | ... | 6.12 | 6.32 | 7.77 |
| Los Angeles (city) | 6.55§ | 8.05 | 8.20† | 6.75 | 9.50 | 6.20 | 8.00-8.50 | ... | 6.70 | 6.40 | 8.15 |
| Los Angeles (w'house) | 6.40§ | 7.90 | 8.05† | 6.60 | 9.35 | 6.05 | 7.85-8.35 | ... | 6.55 | 6.25 | 8.00 |
| Seattle-Tacoma | 6.35[17] | 7.90[5] | 8.40 | 6.70[17] | ... | 6.20[17] | 8.15[1] | 9.45[2] | 6.30[17] | 6.35[17] | 8.40[17] |

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [21]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham.

# PRICES OF LEADING FERROALLOYS PRODUCTS

## MANGANESE ALLOYS

**Spiegeleisen:** (19-21% Mn, 1-3% Si) Carlot per gross ton, $57, Palmerton, Pa., $56, Pittsburgh and Chicago; (16% to 19% Mn.) $1 per ton lower.

**Standard Ferromanganese:** (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, Alloy, W. Va., Welland Ont., Sheridan, Pa., and Lynchburg, Va.; $147 Johnstown, Pa., mill. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $148 fob Aetna, Pa. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with freight allowed on shipments of 25 gross tons or more.

**Low-Carbon Ferromanganese, Regular Grade:** (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l. Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

**Medium-Carbon Ferromanganese:** (Mn 80-85%. C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

**Manganese Metal:** (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

**Silicomanganese:** (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

## CHROMIUM ALLOYS

**High-Carbon Ferrochrome:** Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

**"SM" High-Carbon Ferrochrome:** (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

**Foundry Ferrochrome:** (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of contained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Carbon Ferrochrome:** (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

**"SM" Low-Carbon Ferrochrome:** (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Carbon Ferrochrome, Nitrogen Bearing:** Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

**Chromium Metal:** (Mn 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c, for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

## SILICON ALLOYS

**20-30% Ferrosilicon:** Contract, carload, lump, bulk, 16.50c per lb of contained Si, fob Niagara Falls, N. Y.

**50% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c, for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

**75% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c. Central, add 0.3c for c.l. and 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

**85% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Aluminum 85% Ferrosilicon:** (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

**90% Ferrosilicon:** Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si, carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

**Low-Aluminum 90-95% Ferrosilicon:** (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

**Silicon Metal:** (Over 97% Si and 1% max. Fe.) Eastern Zone c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

**Alsifer:** (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c smaller lots 8.65c. Spot up 0.5c.

## BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx. 3⅜ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for

(*Please turn to Page* 146)

# Advocates Brass Stockpiling

**Dallas, chairman of Revere, proposes program as substitute for government's plan for stockpiling refined copper. Points out objections to latter plan**

**New York** — Substantial quantities of refined copper cannot be stockpiled this year, as contemplated in the program authorized by the last Congress, without further inflationary price increases or other means of curtailing civilian consumption, C. Donald Dallas, chairman of the board, Revere Copper & Brass Inc., said last week.

In a letter to Thomas J. Hargrave, chairman of the Munitions Board, Mr. Dallas proposes an alternative program under which brass obtained from scrap would be stockpiled.

Reviewing the copper supply situation, Mr. Dallas finds that despite high domestic production, imports of 400,000 tons a year of duty-free copper have been necessary to meet the needs of domestic copper consumers. New factors this year are shipments, of large quantities of copper to ECA participating countries, and the stockpiling program.

"There is no prospect of an increase in either domestic or overseas copper production at the mines which would enable a major stockpiling program to be accomplished quickly without serious repercussions in the world market for the metal," Mr. Dallas said.

Estimates of stockpiling needs, Mr. Dallas points out, have left in doubt what the goals of the program may be. But in the light of the experience in the last war the most urgent demand ahead is likely to be for brass, for cartridge cases.

In advocating government stockpiling of brass obtained from scrap, Mr. Dallas observes that the government is itself the largest potential source of brass scrap. He therefore proposes that "the government services carefully canvass their sources of brass scrap to determine whether the maximum quantity is being salvaged; then turn this scrap into a controlled alloy, in cakes suitable for rolling in the mills presently operating.

"Such a stockpile would not only be of very impressive proportions but would give us metal that could be instantly available for use in an emergency. It would not only give us a stockpile of copper, but also of zinc. This kind of stockpile could be accumulated without reaction on the civilian economy—which means without inflationary effect on a tight open market supply."

**Copper**—Stocks of refined copper in the United States at the end of July amounted to 80,469 tons, according to the Copper Institute. Stocks outside of the United States were 147,387 tons, making a total of 227,856 tons. On June 30 last, stocks in this country totaled 73,065 tons and those outside this country were 160,129 tons, making a total of 233,194 tons. Domestic deliveries of refined copper in July were 108,309 tons against 111,927 tons in June. Production of refined copper in July amounted to 107,014 tons against 105,221 tons in June.

**Lead**—Office of International Trade has announced the following export quotas for lead for the third quarter of this year which include all present approved requirements of special projects abroad of vital interest to the United States: Lead pigs and bars, 500 tons; sheets and pipe, 500 tons; solder, 200 tons; lead anodes, 100 tons; lead foil, 50 tons; lead plate or battery plates, 1000 tons; lead scrap and residue, 1000 tons; and lead castings, 200 tons.

**Zinc**—New Jersey Zinc Co. has advanced its prices, effective Sept. 1, 2½ cents a pound on zinc oxides to the following levels in less than carload amounts: Lead-free and 5 per cent leaded, 13.75c; 35 per cent leaded, 15.37½c; 50 per cent leaded, 16.12½c. Carload lots are priced at the customary discount of ¼-cent. These prices are firm for only one month, or through Sept. 30.

Labor trouble in midwestern plants spread last week, making more serious the threat to future supplies.

**Tin**—Production of tin concentrates in the Netherlands East Indies in July was the equivalent of 2547 tons compared with 2414 tons in June and 1117 tons in July, 1947, according to trade reports. For the seven months ended July 31, the production totaled 16,509 tons against 8074 tons during the like 1947 period.

Stocks of pig tin held by the Office of Metals Reserve which were available for sale on July 31 amounted to 37,118 tons, representing an increase of 1417 tons during July and 20,762 tons since Sept. 30, 1947. The allocations continue to diminish and in July amounted to only 4821 tons compared with an average of 5360 tons per month during the final quarter of last year and averages of 5160 tons and 5020 tons, respectively, during the first and second quarters of this year.

## Silver Market Weakens

**New York**—Silver prices turned upward last week following the sharp drop of 1.87½ cents on sales Aug. 13 to 72.75c per ounce. This drop represented the first fluctuation in the silver market here in more than nine months, or since Nov. 3, 1947. The reduction was the result primarily of large offerings of silver here by an important producer. Near the close of last week the market was quoted 73.25c an ounce, after having risen to 73.75c.

In commenting on the Aug. 13 break in the market, a leading seller said: "The supply and demand position of silver prior to July had been about evenly balanced. During July, however, most of the silver manufacturing industry curtailed operations sharply which is a normal vacation period. The silver price structure at around vacation time was generally easy, but during July there was a potential demand in the market for silver for coinage purposes from a middle eastern country. This demand failed to materialize and, with termination of vacations, buying from the silver manufacturing industry also continued at a low ebb.

"Silver refined in the United States is turned over to the United States government for minting purposes. The silver used by the industry is imported from Mexico, Canada, Peru and Chile. The domestic market, however, during the past several months or so has been called upon to absorb over 1 million ounces of silver brought in from Great Britain and Belgium. Production of silver from the latter two countries normally finds a market on the continent but the lack of funds in Europe has caused this silver to seek other markets.

"Another important consideration behind the Aug. 13 decline was the recent weakness in the Mexican peso. Recently, the Mexican government started minting a new peso coin. The drop in the peso value has put it at a level where it is not profitable to manufacture the high-silver content coin and, as a result, silver from this source was forced to seek other outlets."

## Phelps-Dodge Buys Two Plants

**Washington**—Phelps-Dodge Corp. has purchased two plants which the Reconstruction Finance Corp. built during the war at a cost of about $28 million. The projects, one a copper reduction facility at Morenci, Ariz., and the other a copper refining facility located at El Paso, Tex., have been operated under a lease dated March, 1942, by Phelps-Dodge Corp. and its subsidiary, Phelps-Dodge Refining Corp. The sale has been consummated in accordance with the option rights of Phelps-Dodge to purchase the properties, and represents full recovery of cost to RFC, according to Harley Hise, chairman of the latter agency.

## Joint Mining Development

KENNECOTT Copper Corp. and U.S. Smelting, Refining & Mining Co. have announced a joint mining development which will permit Kennecott to extend open pit mining operations in the Bingham, Utah, area.

Chief development will be driving of a four mile tunnel with the portal near Lark, several miles southeast of Bingham Canyon where the present Niagara Tunnel is located. When the new tunnel is completed, probably in three years, the old Niagara tunnel eventually will be abandoned. Development also calls for removal of U.S. Smelting surface plant in Bingham Canyon to a site near portal of new tunnel.

# NONFERROUS METAL PRICES

**(Cents per pound, carlots, except as otherwise noted)**

**Copper:** Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½ Conn. Valley.

**Brass ingot:** 85-5-5-5 (No. 115) 22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.50c.

**Zinc:** Prime western 15.00c, brass special 15.25c, intermediate 15.50c, East St. Louis; high grade 16.00c, delivered.

**Lead:** Common 19.30-19.35c chemical and corroding 19.40c, St. Louis.

**Primary Aluminum: 99% plus, ingots 15.00-16.00c,** pigs 13.50-15.00c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

**Secondary Aluminum: Piston alloy (No. 122 type)** 24.00-24.75c; No. 12 foundry alloy (No. 2 grade) 23.50-24.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.25-25.75c; grade 2, 24.50-25.00c; grade 3, 24.00-24.75c; grade 4, 23.50-24.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

**Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c,** fob Freeport, Tex.

**Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher,** not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

**Antimony: American 99-99.8% and over but** not meeting specifications below, 35.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

**Nickel: Electrolytic cathodes, 99.9%, base sizes** at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

**Mercury:** Open market, spot, New York $75-$77 per 76-lb flask.

**Beryllium-Copper: 3.75-4.25% Be, $20.50 per** lb contained Be.

**Cadmium: "Regular" straight or flat forms,** $1.90, del.; special or patented shapes, $2.

**Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb** under 100 lb.

**Gold: U. S. Treasury, $35 per ounce.**

**Silver:** Open market, New York, 73.25c per ounce.

**Platinum:** $93-$96 per ounce.

**Palladium: $24 per troy ounce.**

**Iridium:** $110-$120 per troy ounce.

## Rolled, Drawn, Extruded Products

### COPPER AND BRASS

(Base prices, cents per pound, fob mill)

**Sheet:** Copper 37.18; yellow brass 33.75; commercial bronze, 95%, 37.11; 90%, 36.63; red brass, 85%, 35.64; 80%, 35.16; best quality 34.63; nickel silver, 18%, 46.41; phosphor-bronze, grade A, 5%, 56.05.

**Rods:** Copper, hot rolled 33.03; cold drawn 34.28; yellow brass, free cutting, 33.44; commercial bronze, 95% 36.80; 90% 36.32; red brass, 85% 35.33; 80% 34.85.

**Seamless Tubing:** Copper 37.22; yellow brass 36.76; commercial bronze 90% 39.29; red brass 85% 38.55; 80% 38.07.

**Wire:** Yellow brass 34.04; commercial bronze, 95% 37.40; 90% 36.92; red brass, 85% 35.93, 80% 35.45; best quality brass 34.92.

**Copper Wire:** Bare, soft, fob eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weatherproof, fob eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

### ALUMINUM

**Sheets and Circles:** 2c and 3c mill finish c.l.

| Thickness Range, Inches | Widths or Diameters, In., Incl. | Flat Sheet Base* | Coiled Sheet Base | Coiled Sheet Circle† Base |
|---|---|---|---|---|
| 0.249-0.136 | 12-48 | 25.9 | ... | ... |
| 0.135-0.096 | 12-48 | 26.4 | ... | ... |
| 0.095-0.077 | 12-48 | 26.9 | 25.0 | 28.6 |
| 0.076-0.068 | 12-48 | 27.5 | 25.2 | 28.8 |
| 0.067-0.061 | 12-48 | 27.5 | 25.2 | 28.8 |
| 0.060-0.048 | 12-48 | 27.7 | 25.4 | 29.1 |
| 0.047-0.043 | 12-48 | 28.1 | 25.6 | 29.4 |
| 0.042-0.038 | 12-48 | 28.1 | 25.6 | 29.4 |
| 0.037-0.030 | 12-48 | 28.5 | 26.0 | 29.9 |
| 0.029-0.024 | 12-48 | 28.9 | 26.3 | 30.3 |
| 0.023-0.019 | 12-36 | 29.5 | 26.7 | 30.8 |
| 0.018-0.017 | 12-36 | 30.1 | 27.3 | 31.6 |
| 0.016-0.015 | 12-36 | 30.8 | 27.9 | 32.5 |
| 0.014 | 12-24 | 31.7 | 28.7 | 33.6 |
| 0.013-0.012 | 12-24 | 32.6 | 29.4 | 34.5 |
| 0.011 | 12-24 | 33.6 | 30.3 | 35.7 |
| 0.010-0.0095 | 12-24 | 34.6 | 31.3 | 37.0 |
| 0.009-0.0085 | 12-20 | 35.8 | 32.4 | 38.5 |
| 0.008-0.0075 | 12.20 | 37.1 | 33.6 | 40.1 |
| 0.007 | 12-18 | 38.5 | 34.9 | 41.9 |
| 0.006 | 12-18 | 40.0 | 36.2 | 46.0 |

*** Minimum length, 60 inches. † Maximum diameter, 24 inches.**

**Screw Machine Stock:** 5000 lb and over.

| Diam. (in.) or distance across flats | —Round— R317-T | 17S-T | —Hexagonal— R317-T | 17S-T |
|---|---|---|---|---|
| 0.125 | 45.0 | 47.0 | ... | ... |
| 0.156-0.203 | 38.5 | 40.0 | ... | ... |
| 0.219-0.313 | 35.5 | 37.0 | ... | ... |
| 0.344 | 34.0 | 36.00 | ... | ... |
| 0.375 | 33.0 | 35.5 | 42.5 | 43.0 |
| 0.406 | 33.0 | 35.5 | ... | ... |
| 0.438 | 33.0 | 35.5 | 42.5 | 43.0 |
| 0.469 | 33.0 | 35.5 | ... | ... |
| 0.500 | 33.0 | 35.5 | 42.5 | 43.0 |
| 0.531 | 33.0 | 35.5 | ... | ... |
| 0.563 | 33.0 | 35.5 | 40.5 | 40.5 |
| 0.594 | 33.0 | 34.5 | ... | ... |
| 0.625 | 33.0 | 35.5 | 40.5 | 40.5 |
| 0.656 | 33.0 | 35.5 | ... | ... |
| 0.688 | 33.0 | 35.5 | 40.5 | 40.5 |
| 0.750-1.000 | 32.0 | 34.5 | 37.0 | 38.0 |
| 1.063 | 32.0 | 34.5 | 35.5 | 36.5 |
| 1.125-1.500 | 31.0 | 33.5 | 35.5 | 36.5 |
| 1.563 | 31.0 | 33.5 | ... | 35.5 |
| 1.625 | 30.0 | 32.5 | 34.5 | 35.5 |
| 1.688-2.000 | 30.0 | 32.5 | ... | ... |
| 2.125-2.500 | 29.5 | 31.5 | ... | ... |
| 2.625-3.375 | 28.5 | 30.5 | ... | ... |

### LEAD

**(Prices to jobbers, fob Cleveland, Pittsburgh)** Sheets: Full rolls, 140 sq ft or more, **$23.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles** and segments. Pipe: Full coils, $22.50 per cwt; cut coils, $22.75. Traps and Bends: List price plus 70%.

### ZINC

Sheets, 19.50-20.00c, fob mill, 36.00 lb and over. Ribbon zinc in coils, 18.25c-19.00c, fob **mill, 36,000 lb and over. Plates, not over 12-in.,** 17.25c; over 12-in., 18.25c.

### NICKEL

**(Base prices, fob mill.)**

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

### MONEL

**(Base prices, fob mill.)**

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes,45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

### MAGNESIUM

**Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.**

## DAILY PRICE RECORD

| | Copper | Lead | Zinc | Tin | Aluminum | Antimony | Nickel | Silver |
|---|---|---|---|---|---|---|---|---|
| July Avg. | 21.574 | 17.621 | 12.444 | 103.00 | 15.500 | 35.000 | 35.833 | 74.625 |
| Aug. 2-9 | 21.50-23.50 | 19.30-19.350 | 15.000 | 103.00 | 15.00-16.000 | 35.000 | 40.000 | 74.625 |
| Aug. 11-12 | 23.50 | 19.30-19.350 | 15.000 | 103.00 | 15.00-16.000 | 35.000 | 40.000 | 74.625 |
| Aug. 13-14 | 23.50 | 19.30-19.350 | 15.000 | 103.00 | 15.00-16.000 | 35.000 | 40.000 | 72.750 |
| Aug. 16 | 23.50 | 19.30-19.350 | 15.000 | 103.00 | 15.00-16.000 | 35.000 | 40.000 | 73.250 |
| Aug. 17-19 | 23.50 | 19.30-19.350 | 15.000 | 103.00 | 15.00-16.000 | 35.000 | 40.000 | 73.750 |

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

## Plating Materials

**Chromic Acid:** 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

**Copper Anodes:** Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 31.84c; oval, 31.34c; electrodeposited, 31.09c; cast, 30.12c.

**Copper Cyanide: 70-71% Cu, 100-lb drums,** 44.00c, fob Niagara Falls, N. Y.

**Sodium Cyanide:** 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

**Copper Carbonate: 54-56% metallic Cu; 50 lb bags,** up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

**Nickel Anodes:** Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; fob Cleveland. Add 1 cent for rolled depolarized.

**Nickel Chloride:** 100-lb kegs, 26.50c; 275-lb, or 500-lb bbls. 24.50c, fob Cleveland.

**Tin Anodes:** Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c, fob Sewaren, N. J.

**Sodium Stannate:** 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

**Zinc Cyanide:** 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

**Stannous Sulphate:** Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl. 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c.

## Scrap Metals

### BRASS MILL ALLOWANCES

(Based on 23.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

| | Clean Heavy | Rod Ends | Clean Turnings |
|---|---|---|---|
| Copper | 21.125 | 21.125 | 20.375 |
| Yellow brass | 18.000 | 17.750 | 17.125 |
| Commercial Bronze | | | |
| 95% | 20.125 | 19.875 | 19.375 |
| 90% | 19.750 | 19.500 | 19.000 |
| Red brass | | | |
| 85% | 19.750 | 19.500 | 19.000 |
| 80% | 19.500 | 19.250 | 18.750 |
| Best Quality (71-79%) | 19.000 | 18.750 | 18.250 |
| Muntz Metal | 17.250 | 17.000 | 16.500 |
| Nickel, silver, 10% | 19.625 | 19.375 | 9.813 |
| Phos. bronze, A. | 22.625 | 22.375 | 21.375 |
| Naval brass | 17.750 | 17.500 | 17.000 |
| Manganese bronze | 17.750 | 17.500 | 16.875 |

### BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 19.75, No. 2 copper 18.75, light copper 17.75, composition red brass 17.00, auto radiators 14.00, heavy yellow brass 12.00, brass pipe, 12.75.

### REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 20.37½, No. 2 copper 19.25, light copper, 18.25, refinery brass (60% copper), per dry copper content 18.00-18.25.

### DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

**Copper and Brass:** Heavy copper and wire No. 1 17.75-18.00, No. 2 16.75-17.00, light copper 15.75-16.00, No. 1 composition red brass 13.75-14.00, No. 1 composition turnings 13.25-13.50, mixed brass turnings 8.00-8.25, new brass clippings 13.50-14.00, No. 1 brass rod turnings 10.50-11.00, light brass 7.25-7.75, heavy yellow brass 9.75-10.00, new brass rod ends 11.00-11.50, auto radiators, unsweated 11.00-11.50, cocks and faucets 10.75-11.00, brass pipe 10.75-11.00.

**Lead:** Heavy 17.00-17.50, battery plates 11.00-11.50, linotype and stereotype 18.00-18.50, electrotype 16.50-17.00, mixed bobbitt 15.75-16.25, solder joints, 19.75-20.25.

**Zinc:** Old zinc 7.75-8.25, new die cast scrap 6.25-6.75, old die cast scrap 4.00-4.50.

**Tin:** No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

**Aluminum:** Clippings 2S 12.00-12.50, old sheets 10.50-11.00, crankcases 10.50-11.00, borings and turnings 5.50-6.00, pistons, free of struts, 10.50-11.00.

# OPEN MARKET PRICES, IRON AND STEEL SCRAP

**Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.**

### PITTSBURGH

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $42.50-43.00* |
| No. 2 Heavy Melt. Steel | 42.50-43.00* |
| No. 1 Busheling | 42.50-43.00* |
| Nos. 1, 2 & 3 Bundles | 42.50-43.00 |
| Machine Shop Turnings | 37.50-38.00 |
| Mixed Borings, Turnings | 38.00-38.50 |
| Short Shovel Turnings. | 39.50-40.00 |
| Cast Iron Borings | 38.50-39.00 |
| Bar Crops and Plate | 49.00-49.50 |
| Low Phos. Steel | 49.00-49.50 |
| Heavy Turnings | 39.50-40.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 65.00-66.00 |
| Machinery Cast | 72.00-73.00 |
| Charging Box Cast | 59.00-60.00 |
| Heavy Breakable Cast. | 57.00-58.00 |
| Malleable | 69.00-70.00 |
| Brake Shoe | 55.50-56.00 |
| Clean Auto Cast | 58.00-59.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 43.50-44.00 |
| R.R. Malleable | 75.00-80.00 |
| Axles | 55.00-56.00 |
| Rails, Rerolling | 58.00-59.00 |
| Rails, Random Lengths | 54.00-56.00 |
| Rails, 3 ft and under | 61.00-62.00 |
| Rails, 18 in. and under | 62.00-63.00 |
| Railroad Specialties | 60.00-60.50 |
| Uncut Tires | 54.50-55.00 |
| Angles, Splice Bars | 53.00-54.00 |

* Plus applicable freight springboard.

### CLEVELAND

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $42.00-42.50* |
| No. 2 Heavy Melt. Steel | 42.00-42.50* |
| No. 1 Busheling | 42.00-42.50* |
| Nos. 1 & 2 Bundles | 42.00-42.50* |
| Machine Shop Turnings | 37.00-37.50 |
| Mixed Borings, Turnings | 36.50-38.50 |
| Short Shovel Turnings. | 38.00-38.50 |
| Cast Iron Borings | 38.00-38.50 |
| Bar Crops and Plate | 47.00-47.50 |
| Punchings & Plate Scrap | 47.00-47.50 |
| Heavy Turnings | 42.00-43.00 |
| Alloy Free Turnings | 40.00-41.00 |
| Cut Structurals | 48.50-51.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 69.00-71.00 |
| Charging Box Cast | 58.00-60.00 |
| Stove Plate | 58.00-60.00 |
| Heavy Breakable Cast. | 54.00-56.00 |
| Unstripped Motor Blocks | 58.00-60.00 |
| Malleable | 78.00-80.00 |
| Brake Shoes | 52.00-53.00 |
| Clean Auto Cast | 68.00-70.00 |
| No. 1 Wheels | 58.00-60.00 |
| Burnt Cast | 56.00-57.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 43.00-44.00* |
| R.R. Malleable | 78.00-80.00 |
| Rails, Rerolling | 60.00-66.00 |
| Rails, Random Lengths | 58.00-59.00 |
| Rails, 3 ft and under | 63.00-64.00 |
| Cast Steel | 56.00-58.00 |
| Railroad Specialties | 58.00-59.00 |
| Uncut Tires | 55.00-56.00 |
| Angles, Splice Bars | 61.00-62.00 |

* Plus applicable freight springboard.

### VALLEY

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $42.50-43.00* |
| No. 2 Heavy Melt. Steel | 42.50-43.00 |
| No. 1 Bundles | 42.50-43.00 |
| Machine Shop Turnings | 37.00-39.00 |
| Short Shovel Turnings. | 39.00-39.50 |
| Cast Iron Borings | 38.50-39.00 |
| Low Phos. | 48.50-50.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 43.00-44.00* |

* Plus applicable freight springboard.

### MANSFIELD

| | |
|---|---|
| Machine Shop Turnings | $37.50-38.00 |
| Short Shovel Turnings. | 39.50-40.00 |

### CINCINNATI

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $42.00 |
| No. 2 Heavy Melt. Steel | 42.00 |
| No. 1 Busheling | 42.00 |
| Nos. 1 & 2 Bundles | 42.00 |
| Machine Shop Turnings | 36.00 |
| Mixed Borings, Turnings | 36.00 |
| Short Shovel Turnings. | 38.00 |
| Cast Iron Borings | 37.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 57.00 |
| Charging Box Cast | 45.00 |
| Heavy Breakable Cast. | 56.00 |
| Stove Plate | 50.00 |
| Unstripped Motor Blocks | 50.00 |
| Brake Shoes | 48.00 |
| Clean Auto Cast | 57.00 |
| Drop Broken Cast | 65.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 43.00 |
| R.R. Malleable | 70.00 |
| Rails, Rerolling | 55.00 |
| Rails, Random Lengths | 54.00 |
| Rails, 18 in. and under | 61.00 |

### DETROIT

(Brokers' buying prices, fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $37.50-38.00 |
| No. 1 Busheling | 37.50-38.00 |
| Nos. 1 & 2 Bundles | 37.50-38.00 |
| No. 3 Bundles | 37.50-38.00 |
| Machine Shop Turning | 31.50-32.00 |
| Mixed Borings, Turnings | 31.50-32.00 |
| Short Shovel Turnings. | 32.50-33.00 |
| Cast Iron Borings | 32.50-33.00 |
| Punchings & Plate Scrap | 42.50-43.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 53.00-58.00 |
| Heavy Breakable Cast. | 47.00-52.00 |
| Clean Auto Cast | 53.00-58.00 |

### BUFFALO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $45.50-47.00 |
| No. 2 Heavy Melt. Steel | 41.75-42.25 |
| No. 1 Busheling | 41.75-42.25 |
| No. 1 & 2 Bundles | 41.75-42.25 |
| Machine Shop Turnings | 36.75-37.25 |
| Mixed Borings, Turnings | 36.75-37.25 |
| Cast Iron Borings | 37.75-38.25 |
| Short Shovel Turnings. | 38.75-39.25 |
| Low Phos. | 46.00-47.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola | 69.00-70.00 |
| Mixed Cupola | 63.50-64.00 |
| Heavy Breakable Cast. | 55.00-57.00 |
| Malleable | 70.00-75.00 |
| Clean Auto Cast | 62.00-64.00 |

Railroad Scrap

| | |
|---|---|
| Rails, 3 ft. and under. | 60.00-61.00 |
| Railroad Specialties | 55.00-56.00 |

### PHILADELPHIA

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $45.00-46.00 |
| No. 2 Heavy Melt. Steel | 41.50 |
| No. 1 Busheling | 41.50 |
| Nos. 1 & 2 Bundles | 41.50 |
| No. 3 Bundles | 39.50 |
| Machine Shop Turnings | 37.50 |
| Mixed Borings, Turnings | 37.50 |
| Short Shovel Turnings. | 38.50 |
| Bar Crop and Plate | 50.00-51.00 |
| Punchings & Plate Scrap | 50.00-51.00 |
| Cut Structurals | 48.50-49.00 |
| Elec. Furnace Bundles | 46.00-47.00 |
| Heavy Turnings | 44.50-45.00 |
| No. 1 Chemical Borings | 42.00-43.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 63.00-65.00 |
| No. 1 Machinery Cast. | 67.00-68.00 |
| Charging Box Cast | 62.00-63.00 |
| Heavy Breakable Cast. | 62.00-63.00 |
| Unstripped Motor Blocks | 59.50 |
| Malleable | 76.00-78.00 |
| Clean Auto Cast | 64.00-65.00 |
| No. 1 Wheels | 68.00-70.00 |

### NEW YORK

(Brokers buying prices, fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $39.00 |
| No. 2 Heavy Melt. Steel | 37.00 |
| No. 1 Busheling | 37.00 |
| Nos. 1 & 2 Bundles | 37.00 |
| No. 3 Bundles | 35.00 |
| Machine Shop Turnings | 30.50-31.00 |
| Mixed Borings, Turnings | 28.50-29.00 |
| Short Shovel Turnings. | 32.50-33.00 |
| Punchings & Plate Scrap | 42.00-42.50 |
| Cut Structurals | 42.00-42.50 |
| Elec. Furnace Bundles. | 42.00-42.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 57.00-58.00 |
| Charging Box Cast | 56.00-57.00 |
| Heavy Breakable | 56.00-57.00 |
| Unstripped Motor Blocks | 52.50-53.50 |
| Malleable | 68.00-69.00 |

### BOSTON

(Fob shipping point)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $34.40-36.40 |
| No. 2 Heavy Melt. Steel | 34.40 |
| No. 1 Bundles | 34.40 |
| No. 1 Busheling | 34.40 |
| Machine Shop Turnings | 29.40 |
| Mixed Borings, Turnings | 29.40 |
| Short Shovel Turnings | 31.40 |
| Bar Crops and Plate | 38.00-39.00 |
| Punchings & Plate Scrap | 38.00-39.00 |
| Chemical Borings | 34.00-36.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 62.00-64.00 |
| Heavy Breakable Cast | 53.00-55.00 |
| Stove Plate | 52.00-54.00 |
| Unstripped Motor Blocks | 46.00-48.00 |
| Clean Auto Cast | 54.00-56.00 |

### CHICAGO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $41.50-42.00 |
| No. 2 Heavy Melt. Steel | 41.50-42.00 |
| No. 1 Bundles | 41.50-42.00 |
| No. 2 Bundles | 41.50-42.00 |
| No. 3 Bundles | 39.50-40.00 |
| Machine Shop Turnings | 36.50-37.00 |
| Mixed Borings, Turnings | 36.50-37.00 |
| Short Shovel Turnings. | 39.50-40.00 |
| Cast Iron Borings | 39.00-39.50 |
| Bar Crops and Plate | 47.00-48.00 |
| Punchings | 48.00-49.00 |
| Elec. Furnace Bundles. | 42.50-43.00 |
| Heavy Turnings | 41.00-41.50 |
| Cut Structurals | 46.50-47.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 69.00-71.00 |
| Clean Auto Cast | 69.00-71.00 |
| No. 1 Wheels | 62.00-63.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 47.00-48.00 |
| Malleable | 79.00-80.00 |
| Rails, Rerolling | 64.00-64.50 |
| Rails, Random Lengths | 56.00-57.00 |
| Rails, 3 ft and under | 60.00-61.00 |
| Rails, 18 in. and under | 61.00-62.00 |
| Railroad Specialties | 56.00-57.00 |
| Angles, Splice Bars | 55.00-56.00 |

### ST. LOUIS

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $44.00-45.00 |
| No. 2 Heavy Melt. Steel | 40.00-41.00 |
| Machine Shop Turnings | 35.00-36.00 |
| Short Shovel Turnings | 36.50-37.50 |

Cast Iron Grades (Fob shipping point)

| | |
|---|---|
| No. 1 Cupola Cast | 65.00-67.00 |
| Mixed Cast | 56.00-58 00 |
| Heavy Breakable Cast. | 59.00-60.00 |
| Brake Shoes | 60.00-61.00 |
| Clean Auto Cast | 65.00-67.00 |
| Burnt Cast | 59.00-60.00 |

Railroad Scrap

| | |
|---|---|
| R. R. Malleable | 71.00-72.00 |
| Rails, Rerolling | 63.00-65.00 |
| Rails, Random Lengths | 56.00-59.00 |
| Rails, 3 ft. and under | 60.00-61.00 |
| Uncut Tires | 51.00-52.00 |
| Angles, Splice Bars | 54.00-56.00 |

### BIRMINGHAM

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $39.50 |
| No. 2 Heavy Melt. Steel | 39.50 |
| No. 1 Busheling | 39.50 |
| Nos. 1 & 2 Bundles | 39.00 |
| No. 3 Bundles | 37.00 |
| Long Turnings | 24.50 |
| Short Shovel Turnings. | 26.00-27.00 |
| Cast Iron Borings | 25.00 |
| Bar Crops and Plate | 40.00 |
| Cut Structurals | 38.50 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 61.00 |
| Stove Plate | 60.00-62.00 |
| No. 1 Wheels | 59.00-61.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | 38.00 |
| R.R. Malleable | nom. |
| Axles, Steel | 50.00 |
| Rails, Rerolling | 53.00-55.00 |
| Rails, Random Lengths | 45.00-48.00 |
| Rails, 3 ft and under | 53.00-55.00 |
| Angles and Splice Bars | 52.00-53.00 |

### SAN FRANCISCO

| | |
|---|---|
| No. 1 Heavy Melt. Steel | *27.50 |
| No. 2 Heavy Melt Steel | *27.50 |
| No. 1 Busheling | *27.50 |
| Nos. 1 & 2 Bundles | *27.50 |
| No. 3 Bundles | *24.50 |
| Machine Shop Turnings | *18.00 |
| Bar Crops and Plate | *27.50 |
| Cast Steel | *27.50 |
| Alloy Free Turnings | *18.00 |
| Cut Structurals | *27.50 |

Railroad Scrap

| | |
|---|---|
| No. 1 Heavy Melting | *28.50 |
| Axles | *34.00 |
| Rails, Random Lengths | *29.00 |

* Fob California shipping point.

### SEATTLE

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $26.00 |
| No. 2 Heavy Melt. Steel | 26.00 |
| No. 1 Busheling | 26.00 |
| Nos. 1 & 2 Bundles | 22.00-23.00 |
| No. 3 Bundles | 22.00-23.00 |
| Machine Shop Turnings | 19.00-21.00 |
| Mixed Borings, Turnings | 19.00-21.00 |
| Punchings & Plate Scrap | 26.00-28.00 |
| Cut Structurals | 26.00-28.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 40.00-42.00 |
| Heavy Breakable Cast. | 35.00 |
| Stove Plate | 30.00 |
| Unstripped Motor Blocks | 32.50 |
| Malleable | 40.00 |
| Brake Shoes | 35.00 |
| Clean Auto Cast | 40.00 |
| No. 1 Wheels | 35.00 |

Railroad Scrap

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | $2.00 |
| Railroad Malleable | 30.00 |
| Rails, Random Lengths | 21.50 |
| Angles and Splice Bars | 23.00 |

### LOS ANGELES

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $25.00 |
| No. 2 Heavy Melt. Steel | 25.00 |
| Nos. 1 & 2 Bundles | 25.00 |
| Machine Shop Turnings | 16.00 |
| Mixed Borings, Turnings | 15.50-16.00 |
| Punchings & Plate Scrap | 28.00 |
| Elec. Furnace Bundles. | 28.00 |

Cast Iron Grades

| | |
|---|---|
| No. 1 Cupola Cast | 35.00-36.00 |

### HAMILTON, ONT.

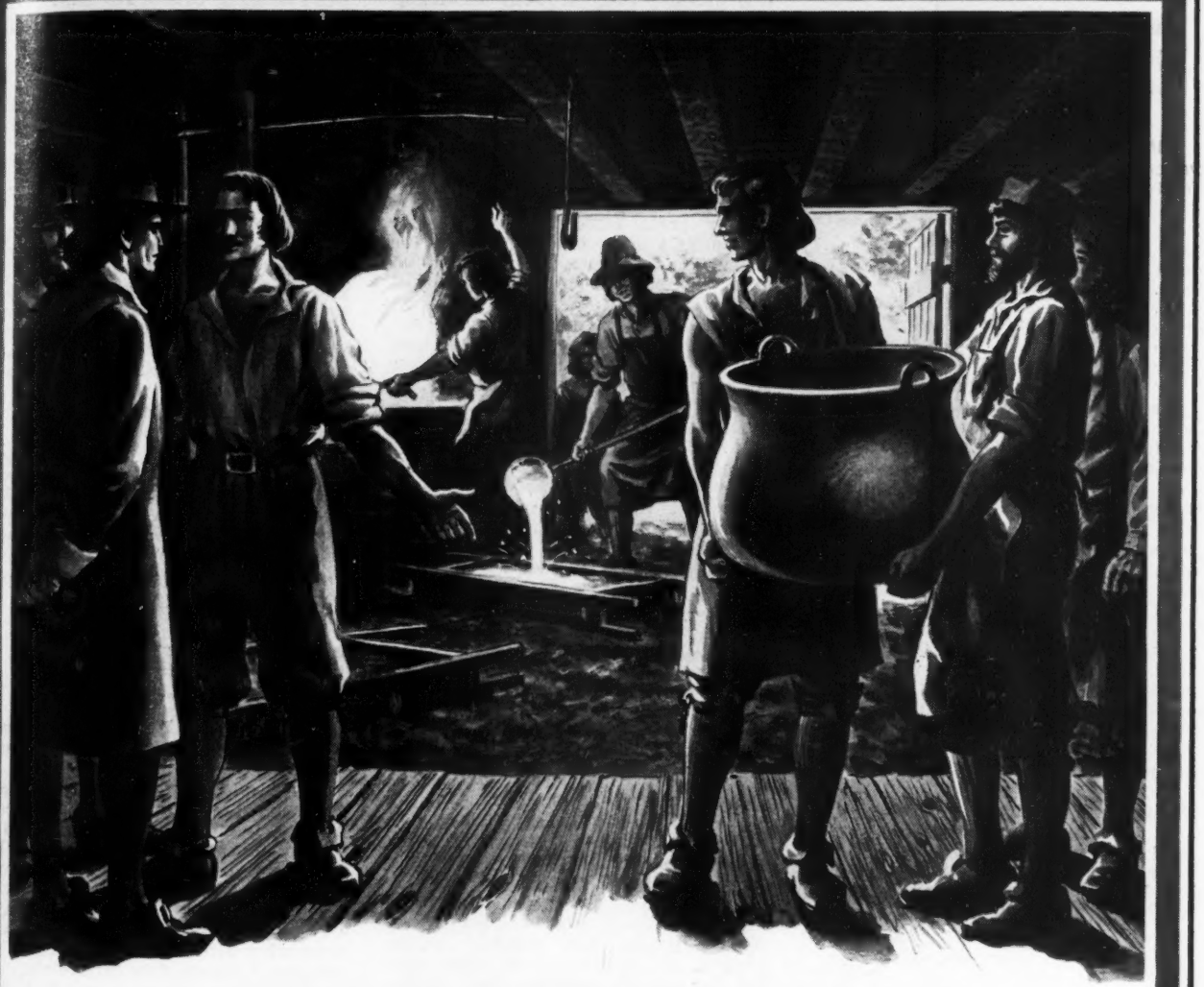
(Ceiling prices, delivered)

| | |
|---|---|
| Heavy Melt. | $22.00 |
| No. 1 Bundles | 22.00 |
| Mechanical Bundles | 20.00 |
| Mixed Steel Scrap | 19.00 |
| Mixed Borings, Turnings | 17.00 |
| Rails, Remelting | 28.00 |
| Rails, Rerolling | 26.00 |
| Bushelings | 17.00 |
| Bushelings, new factory, prep'd | 21.00 |
| Bushelings, new factory, unprep'd | 16.00 |
| Short Steel Turnings | 17.00 |

Cast Iron Grades*

| | |
|---|---|
| No. 1 Cast | 42.00-43.00 |
| No. 2 Cast | 35.00-37.00 |

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

## Plates . . .

### Lukens Steel advances stainless, nickel, iconel and monel-clad steel plates

Plate Prices, Page 123

**Pittsburgh** — Lukens Steel Co. advanced stainless-clad plate prices, effective Aug. 18, as follows:

Stainless Clad Plates
(Cents per pound)

| | 10% | | 20% | |
|---|---|---|---|---|
| Grade | New | Old | New | Old |
| 304..... | 23.00 | 20.00 | 27.00 | 24.00 |
| 316..... | 28.00 | 24.50 | 32.00 | 28.50 |
| 347..... | 25.75 | 22.50 | 29.75 | 26.50 |
| 405..... | 18.75 | .... | 24.75 | .... |
| 410..... | 18.25 | 18.00 | 24.75 | 22.00 |
| 430..... | 18.25 | 18.50 | 24.25 | 22.50 |

The price spread between solid stainless and stainless-clad plate prices in the 18-8 series have been narrowed; in the straight chromium classification the price relationship has been widened.

In addition to increasing base prices on stainless-clad plates an average of about 10 per cent, Lukens Steel revised the circle extra to 33⅓ per cent, compared with 30 per cent previously in effect. Quantity extras are the same for under 10,000 pounds brackets; under 20,000 to 10,000 pounds the extra is $1 per 100 pounds against $1.50 formerly; for 20,000 pounds and over there is no charge, previously from 20,000 to 40,000 pounds the charge was $1.00.

Lukens also revised nickel-clad plate prices about 20 per cent to reflect 6 cents per pound increase in solid nickel plates. Company's prices on nickel-clad plates (1¼-inch and heavier up to 2 inches exclusive), iconel-clad and monel-clad, are as follows:

(Cents per Pound)

| Clad- | 5% | | 10% | | 15% | | 20% | |
|---|---|---|---|---|---|---|---|---|
| ding | New | Old | New | Old | New | Old | New | Old |
| Nickel | 24 | 18 | 27½ | 21½ | 31 | 25 | 34½ | 24½ |
| Iconel | 31 | 25 | 36 | 30 | 41 | 35 | 46 | 40 |
| Monel | 25 | 20 | 29 | 24 | 33 | 28 | 37 | 32 |

The 5 per cent grades are available only in plates ½-inch thick and heavier. All company's prices are f.o.b. Coatesville, Pa.

**New York** — Gradual nibbling against carbon plate production for voluntary distribution program requirements is narrowing the tonnage for rank and file fabricating shops. Pending clarification of volume to be earmarked, allocation for fourth quarter is slow. Some producers are seeking more leeway on equal monthly shipments on a quarterly basis, considering shipment of quotas at mill convenience during the period. Integrated fabricating needs are also cutting into the volume of plates for sale; this situation will continue indefinitely and will increase for shipbuilding. One 68-inch mill in the Buffalo district has gone over to sheets, reducing the volume of wide plates. While there are a few exceptions, carryovers on Oct. 1 will be fully as large, if not heavier, further restricting fourth quarter volume. Along with sustained demand for plates, floor plates are strong and the total tonnage ordered would indicate some off-pattern applications, despite efforts of mills in discouraging substitutions.

**Boston**—Heavier demand for plates for shipbuilding portends a progressive tightening in supply for general distribution, coupled with mounting voluntary programs and selective selling with mill backlogs on light carbon material out of balance. Mills rolling the latter are over balanced. An outstanding development in ship construction is the more diversified work at Bethlehem Steel Co.'s Quincy yard where passenger ships, tankers and war craft are under contract; Fore River in the past has been largely a war craft builder. Five 28,000-ton tanks will be built at Quincy for Atlas Tankers Inc., the $30 million order bringing to 10 the number of supertankers to be constructed at the yard. With a capacity of 240,000 barrels each, the Atlas tankers are 600 feet long and single screw; delivery is for 1950. With few, if any exceptions, fourth quarter allocations to fabricating shops will be lower, depending on the extent of increased earmarked tonnage for voluntary allocation. Hardest pressed for plates are users of light gage carbon stock which includes most tank shops.

**Philadelphia**—To date, inroads on steel allocations by voluntary distribution requirements have been greatest on products in shortest supply. This is notably true in plates, one of the first involved heavily for freight car building. The tank program is scheduled for 40,000 tons per month, starting October through February at least, with additional volume required for war craft and passenger ships. Another slice of plate production is earmarked for barges. With several other programs under consideration, volume of plates for open market distribution is constantly shrinking with result fabricators of carbon plates, notably in lighter gages, are steadily losing ground. Establishment of plate quotas for fourth quarter has, therefore, developed slowly, producers not knowing definitely how much steel they will have to parcel out.

**Birmingham**—The plate situation has tightened materially in the last few weeks due to voluntary allocations programs. Another contributing factor is production of steel pipe at Republic's Gadsden tube mill. A fairly steady flow of plates for car building is maintained and some lighter gages are reported more in balance.

**Seattle**—Plate fabricators report material shortages are more acute and a serious handicap to expanded operations. Inquiry is brisk for small contracts but plants are hesitant in accepting new business under the circumstances. No large projects are pending.

## Steel Bars . . .

Bar Prices, Page 122

**New York**—Where fourth quarter allocation of hot-rolled carbon bars have been made, some sizes and grades are blanked out for October and quotas generally are somewhat lower than for third quarter, down nearly 10 per cent with some mills. Cold-finishing mills are mostly sold through next quarter and, in view of the outlook for a decline in hot-rolled tonnage, more concern is apparent as to ability to meet commitments. Several producers who have been booking orders for first quarter have stopped. Among alloys, only hot-rolled electric furnace grades are available for late next quarter, schedules for that period on others being filled. All mills have not allocated carbon bars for the final three months, potential tonnage beyond October being held in abeyance.

**Philadelphia**—While carbon bar allocations for fourth quarter are among the first steel products to be scheduled for that period, blankouts and cutbacks on some sizes and grades for October are drastic. As in most carbon products, fourth quarter allocations are down, although in few instances not as much as in some others. Inroads against backlog carryovers are disappointing and part of lower quotas is due to efforts to catch up. Alloy bars are more extended and mill order books reflect an easing in selling efforts on these grades. Cold finishing schedules are filled through balance of this year with producers concerned as to whether or not hot-rolled allocations actually shipped will cover commitments.

## Sheets, Strip . . .

Sheet Prices, Page 122

**New York** — Reductions up to 10 per cent are likely in some fourth quarter sheet allocations based on October quotas which may not be at the same level for November-December, depending on volume drained into voluntary must programs. Hot and cold flat-rolled carbon products fluctuate more than specialties, orders for the latter having been taken earlier, with most fourth quarter schedules already filled. While the abnormal demand is minimizing impact of price increases and f.o.b. mill selling, an uneven pattern of distribution and widening differential in prices with higher consumer costs is developing. There are already, even under stress of demand over supply, minor dislocations, which contribute to the tightening tonnage, notably as the consumer plant becomes far removed from source of supply. Several cold strip producers in the East have not yet adopted the mill basing system. On some steel products, including flat-rolled, the nearest mill cannot supply all tonnage required by several eastern districts.

**Boston**—While all have gone along on the price advance, increases are not uniform and several narrow cold strip producers are not selling on a f.o.b. mill base. Pittsburgh, Cleveland and Worcester are retained as basing points, one New England mill selling low carbon at 5.00c, Pittsburgh. Prices are confused and mixed, for the most part higher than the country average on the part of mills who have abandoned the former basing point system and gone on f.o.b. mill basis. Substantial volume is moving at mill from 4.50c to 4.75c (carbon, 26.00-40.00); there are also mill price ranges on tempered and annealed cold-rolled spring steel. Under the circumstances consumers are more or less at sea on steel costs, more so on cold strip than in other flat-rolled products.

**Philadelphia** — Carbon sheet ton-

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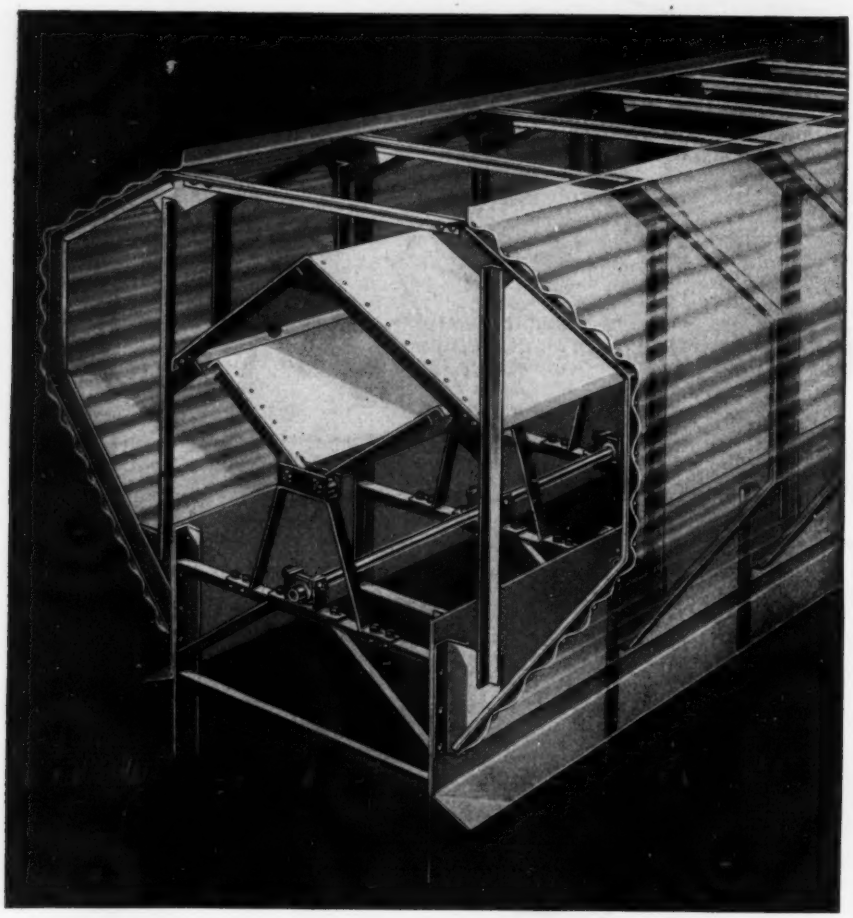

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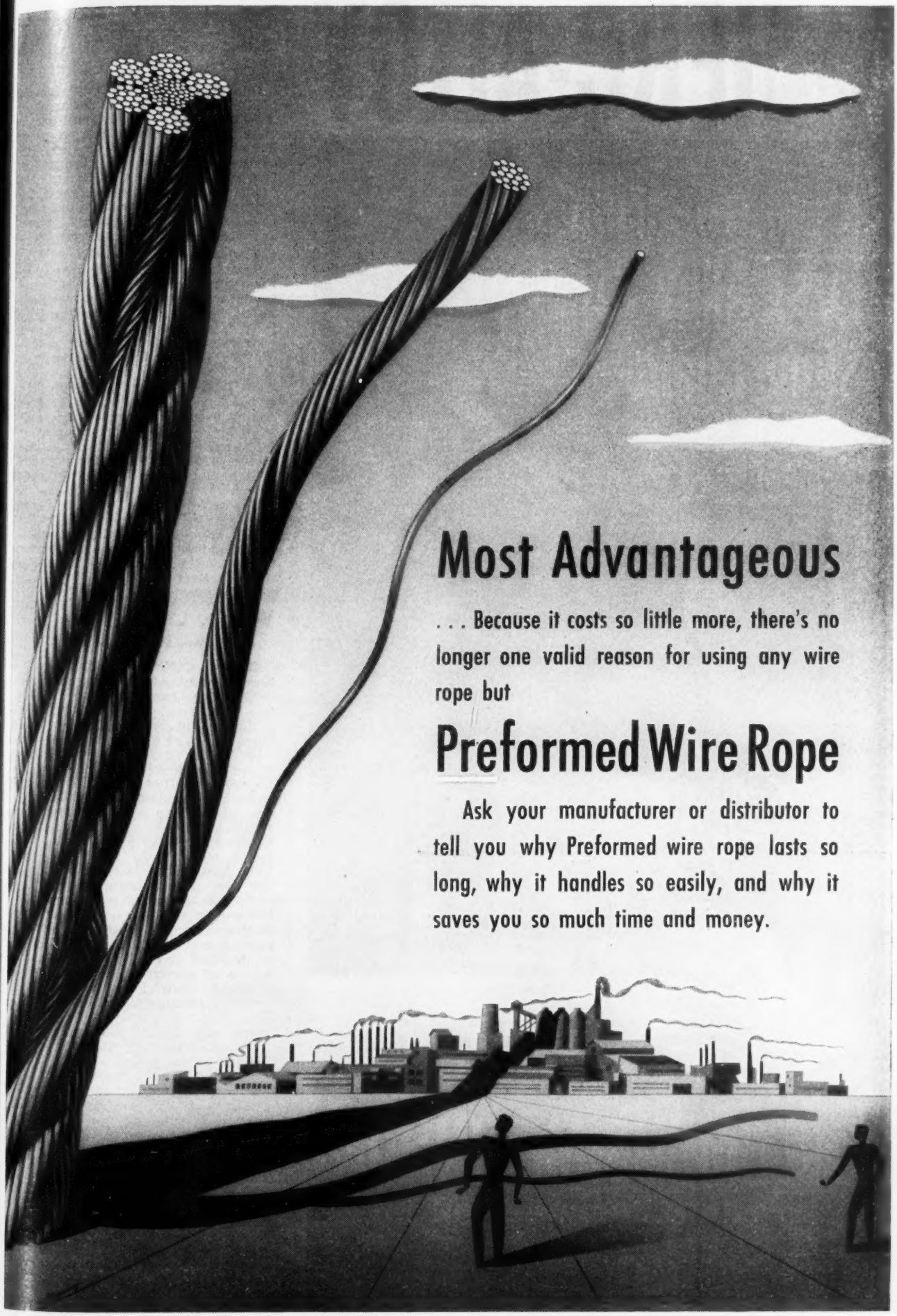
nage will be lower in the fourth quarter to average consumers not included in voluntary distribution program volume. While allocations are rarely scheduled beyond October, quotas will vary between mills and reductions from those for the current quarter will approach 20 per cent in some cases; the overall average is estimated near 10 per cent. In effect, most producers are forced to month-to-month scheduling due to uncertainty as to how much program distribution will come out of the whole. If this tonnage is larger than estimated earlier, with indications that it will be, November-December volume may shrink under October levels. Carryovers are also a factor and several mills will have no allocation of hot-rolled and little of cold-rolled. With demand far in excess of supply and the impact of higher prices coupled with mill pricing, steel men are inclined to be more uncertain as to 1949. Higher prices for finished consumer goods with better supply of these products available, growing price resistance by ultimate consumers, and tightening credit controls are factors given more consideration as to probable buying next year. None of these has reached mill level as evidenced by unabated demand for steel, but many fabricators are pressing for higher priced steel which they may not immediately need.

**Pittsburgh** — Sellers report substantial increase in inquiries for freight rates covering barge or truck or combination of rail-barge-truck to customers' plants. There has been no significant revision to date, however, in shipping instructions, as customers are more concerned in obtaining steel via quickest route regardless of added costs involved.

Volume of incoming orders appears to indicate little headway has been made against tremendous pent-up demand for flat rolled steel products, with production failing to meet even urgent customer requirements despite relatively long period of steady production and additional rolling capacity. Scarcity of sheet and strip constitutes major limiting factor preventing metalworking companies from achieving full production schedules. Indicative of this situation are continued ingot conversion deals and purchase of idle steel foundry melting capacity by metalworking firms to supplement their supply. Increase in tonnage commitments under voluntary allocations programs is expected to force producers to reduce fourth quarter quotas 5 to 10 per cent.

**Chicago** — Smaller consumers of flat-rolled products are showing increasing concern over the mounting tonnage of voluntary allocations called for in programs which the government is working out with essential industries and steel producers. Despite the fact that these programs so far earmark steel at less than 8 per cent of the country's output and will not require this proportion for several months to come, the small users fear that their scanty mill quotas will be cut dangerously. A few mills have assigned quotas for fourth quarter at approximately the same level as third because they are unable to calculate the effect voluntary allocations will have on shipments. It is likely, therefore, that such readjustments as must be made will come in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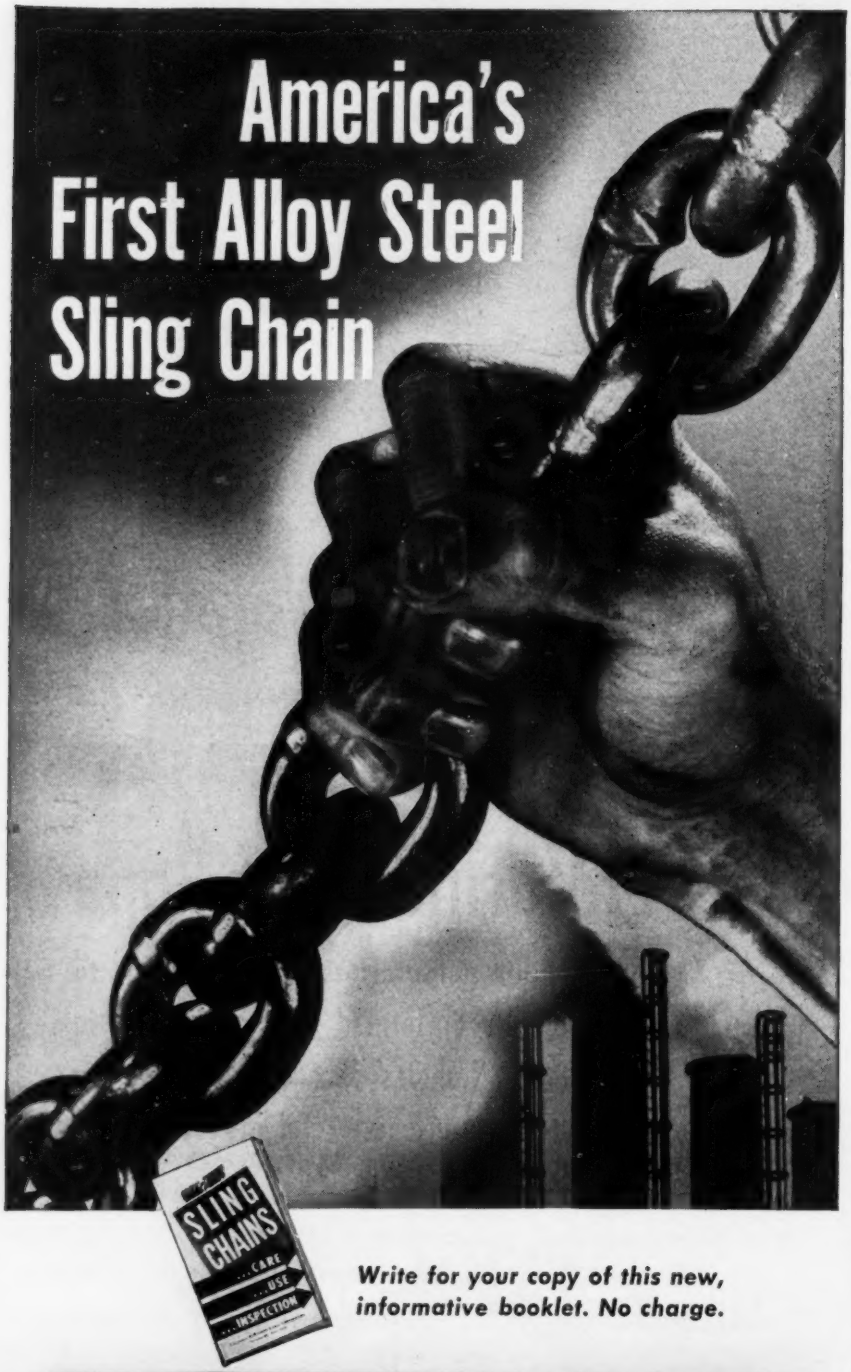


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first quarter, 1949. Manufacturers of dairy equipment report a slump in demand—whether this is more than temporary remains for fall dairy shows to demonstrate.

**Cincinnati**—A further tightening of the sheet supply is apparent as district mills prepare to fulfill quotas in the voluntary allocation programs. Effect of the military program will come prominently into calculations for fourth quarter allotments for other customers. So far, sheet fabricators at a distance from mills continue to ask for tonnage, ignoring any higher delivered costs.

**Birmingham** — Although hot-rolled plate is at virtual capacity for the most part, the unbalanced situation between supply and demand persists. Sheet users are looking hopefully, if not too expectantly, to early conversion of the Fairfield mill to cold-rolled products with an additional 130,000 tons in prospect.

**St. Louis** — Sheet production continues at under 50 per cent of capacity here, with the prospects for the rest of the year remaining uncertain until Granite City Steel Co. completes removal of bugs from its new cold reduction mill. The equipment currently is concentrating on tin plate, which makes tonnage figures give an incomplete picture of the mill's real operating performance. The company expects to open its books for the fourth quarter the last week in September.

## Wire . . .

Wire Prices, Page 123

**Boston** — Never have wire prices been more mixed. Starting with rods, differentials range through the entire list of finished products and some mills are not yet on an f.o.b. basis. Price structure on rods indicates some wide shifts in sources once supply approximates demand. Boston delivered price on 7/32 to 3/8-inch basic rods is 3.88c from Worcester, 4.04c Johnstown and 4.82c Monessen. Production at Worcester is not sufficient for this area and mills at the latter points, also Sparrows Point, have contributed much toward keeping several nonintegrated plants going: the Monessen producer has a Worcester subsidiary, Johnson Steel & Wire division. With these differences in rod costs, it naturally follows in finished wire, depending on the source of semifinished. Yet demand for finished wire is so heavy for most products there is but slight consumer reaction, but plenty of confusion; many have not digested the potentialities as to costs under new pricing and basing policy.

**Chicago** — Requirements for nails are the heaviest for any period this year, with makers standing little chance of catching up in the near future. At the same time, demand for fence and barbed wire in the midwestern area continues heavy with supplies short. In contrast, the supply of poultry netting, lawn fence and welded utility fabric are more easily available. Because of the heavy volume of highway and road construction and numerous airport expansion projects, concrete reinforcement mesh supplies are extremely tight.

**Birmingham** — Jobber outlets re-

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port a continuing scarcity of most wire items, particularly fencing and nails. Considerable construction throughout the section, most of it apartments and private dwellings, is calling for a persistently high supply of nails.

## Structural Shapes . . .

Structural Shape Prices, Page 123

**New York** — Structural allocations for October-November are shaping up with warehouses included, but tonnage for December is uncertain. Until volume to be siphoned into voluntary distribution programs is more definitely known, total tonnage which fabricators may expect is indefinite. Some shops in the East are over-committed on the basis of lower quotas and will be forced to shop around for fill-in lots. Considering the higher costs in the building industry, including fabricated structural steel, surprising volume is up for estimates on a firm go-ahead schedule and awards are more numerous, including a 1100-ton telephone building addition, Newark, N. J.

**Boston** — The 3700-ton bridge superstructure, Housatonic river, Shelton-Derby, Conn., will be rebid; one tender previously received from American Bridge Co. was rejected. Prices and costs have advanced since the first estimate, and bids this time are likely to be higher. In addition, Connecticut has bridges up for estimates requiring 350 tons, but highway work taking steel in other New England states is small. Growing number of voluntary allocations and the continuance of others at high levels, including the freight car building schedule, is gradually narrowing tonnage of structurals available, while looming ahead are heavier shipyard needs.

**Philadelphia**—October may well be the best tonnage month in fourth quarter for structural fabricators and other users, depending on how much shape tonnage is channeled off to other needs. In any event, less volume will be available during the last three months than was delivered this quarter. Housing, freight car building and shipyards later will account for substantial tonnages. Steel buyers with firm price contracts are among the first to realize effect of recent price increase and mill pricing. Since early July, structural steel has advanced around $20 a ton and reinforcing bars substantially more. Contractors with firm prices covering public works, including bridges, and not covered on all steel, are feeling the pinch; but most projected construction is going ahead with fair volume up for estimates.

**Chicago** — Because structural mills are unable to supply plain shapes in quantities required, fabricators show little inclination to compete on new work which comes out for bids. The greatest volume of work offered are public works, such as highway bridges, and power projects. Private work consists of new manufacturing plants and expansions, but this work appears to be declining in the face of high construction costs and shortage of steel. Steelmakers estimate that the growing aggregate of voluntary allocations promulgated by the government will take a heavier toll of structural shapes and plates than

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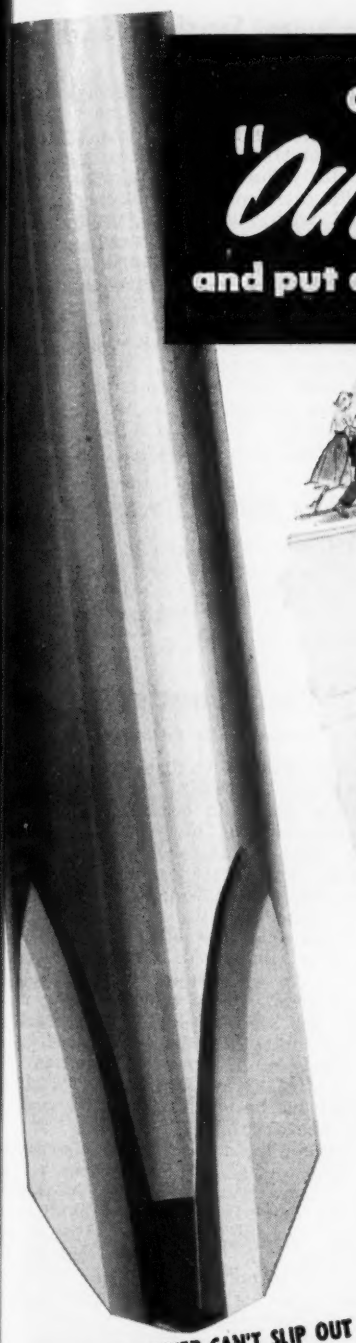

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**Seattle**—The material situation is growing more serious in the fabricating field. Fabricators will require all of current inventories for present commitments and are by-passing bid calls because of uncertainties. Coast mills are booked to the end of 1948. One fabricator reports an offer from a Luxemburg plant promising delivery of beams in three months.

## Bookings of Structurals Riso

**New York** — Structural bookings for June amounted to 158,270 tons, or 15 per cent greater than those of the preceding month, according to American Institute of Steel Construction. Bookings for the first six months totaled 952,235 tons, or 25.6 per cent over those reported in the same period of 1947 and 37.7 per cent over the first half year bookings in the five prewar years of 1936-1940, inclusive.

June shipments were 147,697, bringing total for the first six months up to 948,030 tons, or 7.8 per cent more than in corresponding period of last year. Tonnage available for fabrication at end of June for next four months amounted to 647,474 tons.

Bookings for April and May have been revised to 152,154 and 135,635 tons, respectively, and shipments for to 165,732 and 179,653 tons.

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## Equipment Suppliers' Sales Lag

**Detroit** — Scattered reports are heard from equipment suppliers, complaining over having to "scratch gravel" for new business. Builders of heat treating furnaces find a particularly dull market, along with unwillingness of large buyers to proceed with substantial programs already figured. Machinery buying is active for the Packard automatic transmission department, and Oldsmobile, is installing a considerable volume of new tools for building a high-compression V-8 valve-in-head engine to appear in 1949 Futuramic models. Cadillac also is changing its engine design, but is well along on equipment installation and tooling, planning announcement in October.

## Timken Adopts f.o.b. Pricing

**Canton** — Timken Roller Bearing Co. has announced that effective Aug. 23 all products of its Steel & Tubes Division will be sold, quoted and invoiced f.o.b. mill.

## Tubular Goods . . .

Tubular Goods Prices, Page 123

**New York**—At least one steel pipe producer is revising sales and distribution policy in regard to consigned stocks, halting the practice and making clear-cut sales of pipe to jobbers as in other steel products. Demand for pipe is unabated; supply and backlog situation with mills is the most critical among steel products, not excepting flat-rolled. Heavier requirements for ships, new construction and conversions loom ahead, while utilities are able to place only a fraction of estimated needs. Delivered price on butt and lap weld pipe in the immediate New York area is about equal as between the mills supplying the district.

**Philadelphia** — There is some reshuffling of steel pipe jobber accounts and more is in the offing. With this trend, there is some movement away from distribution through consigned stocks. Pipe held under the latter system is nominally owned by mills and involves red tape and reports by the distributor to the point some jobbers go along with the policy of buying merchant steel pipe outright for resale. In pipe, the mill pricing tends to have more immediate repercussions than on most other products. A Pittsburgh-mill pipe-jobber in Baltimore area, for example, occupies a unique position since Sparrows Point is now the lowest mill price point for butt and lap weld. Steel pipe supply is below requirements and some list pipe among tightest products.

**Pittsburgh**—National Tube Co. has advanced analysis extras 9.5 per cent for stainless steel tubing under schedule M and has reduced distributors' discounts on shipments to warehouses by 5 per cent.

The company also increased analysis extras 20.5 per cent applying to 5 to 10 per cent chrome tubing under schedule B-2. The combination base price and extras for welded stainless tubing, based at Gary, Ind., only, have been increased 10 per cent.

Standard pipe producers have not

yet followed Mercer Tube & Mfg. Co.'s action in advancing galvanized pipe $7 a ton (or 3½ points lower discount) to offset the 3-cent per pound increase in slab zinc.

**Seattle**—The cast iron pipe market is quiet because of the inability of mills to make deliveries in less than 24 months. The potential demand for cast iron goods is of major proportions in this area, but many projects have been postponed and on others substitutes are being specified.

## Tin Plate . . .

Tin Plate Prices, Page 123

**Pittsburg, Calif.** — Initial tin plate production is under way at Columbia Steel Co.'s plant. To date output has been restricted to coke tin plate. Company established Pittsburg, Calif., mill price of $7.55 per base box on 1.50-lb hot-dipped coating, and $7.35 for 1.25-lb coating, effective Aug. 17. Base price for 1.50-lb coating is subject to the standard list of extras and deductions established by other tin plate producers which determine quotations for electrolytic, canmaking black plate, etc. Columbia expects to be producing electrolytic and canmaking black plate within near future, at which time the standard extras and deductions would become applicable on items produced.

Columbia's mill price of $7.55 is 75 cents per base box over Pittsburgh mills' price. Most tin plate shipments from Pittsburgh are sent all rail, involving $1.03 freight. Rail-ocean rate from the eastern steel producing area is $1.12 per base box.

**Pittsburgh** — Some minor changes in tin plate order distribution may develop as early as fourth quarter as result of producers' decision to price tin mill products at the production point. Consumers are scrutinizing their tin plate requirements in relation to mill locations, transportation possibilities, etc. In this connection there is some basis for the belief that considerable increase in tin plate shipments via barge is in the offing during more competitive periods. Producers report a flurry of inquiries requesting truck freight rates, as well as barge, to various destinations. Up to this date, sellers have not noted significant upward trend in shipping instructions requesting barge deliveries. It is pointed out that as long as the present unbalanced demand-supply situation exists, there likely will not be much change in the current relationship between rail, truck and barge transportation.

Major tin plate consuming areas are short of production capacity. This is particularly true in the Atlantic and Pacific central areas and to a lesser extent in the Chicago district. As long as this situation exists, tin plate producers in the Pittsburgh-Weirton area will have little difficulty in distributing their output, despite freight disadvantage involved on shipments into some consuming districts.

Sellers indicate that expected decline in tin plate requirements of food pack program during the fourth quarter will more than be offset by pentup requirements of general line cans. Inventory position among can companies, as well as tin plate producers, is reported well below normal. This factor alone would more than sustain present record production schedules throughout fourth quarter.

## Iron Ore . . .

Iron Ore Prices, Page 124

**Cleveland** — Consumption of Lake Superior iron ore totaled 6,479,032 tons in July compared with 6,577,471 tons in June and 6,156,401 tons in July of last year, according to the Lake Superior Iron Ore Association, this city. This brought the total for the first seven months of this year to 44,820,566 tons compared with 46,-387,053 tons in the like 1947 period. Consumption in the United States totaled 6,239,396 tons in July compared with 6,342,447 tons in June and 5,-936,426 tons in July, 1947.

As of Aug. 1, there were 170 furnaces in blast in the United States against 171 on July 1 and 167 a year ago, while the number idle were 14, 13 and 16, respectively.

Total stocks of Lake Superior iron ore increased 5,646,277 tons last month to a total of 32,610,785 tons. This compared with 28,440,332 tons on Aug. 1, 1947. Of the Aug. 1 total, 28,053 tons were at furnaces in this country and 1,365,970 tons at Canadian furnaces, and 3,191,492 tons on Lake Erie docks in the United States.


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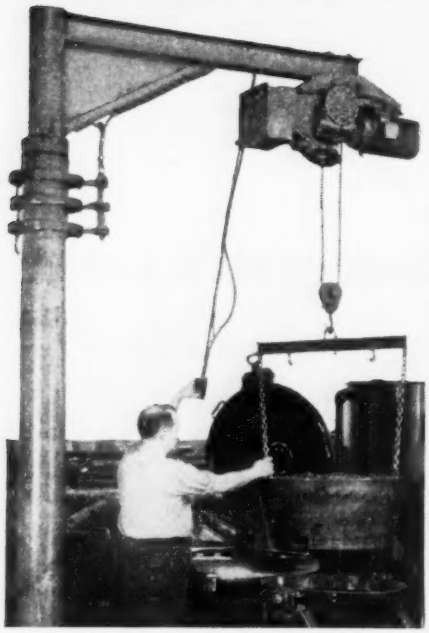

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## Pig Iron . . .

### Missouri-Illinois Furnaces Inc. advances prices $2.65 to level 31 per cent above December

Pig Iron Prices, Page 124

**St. Louis** — Missouri-Illinois Furnaces Inc., Granite City, Ill., subsidiary of Koppers Co. Inc., has announced an increase of $2.65 in the price of pig iron. That brings the f.o.b. price of basic to $47.90; foundry iron to $48.40, and malleable to $48.90. The increase puts its prices 31 per cent above those of last December. Last previous increase was May 15, when the price went up $1.25 a ton to $45.25. Before that there was a $4.50 rise in March and a $3 rise about Jan. 1. The company supplies about 90 per cent of this district's iron. Its principal customer, Granite City Steel Co., has announced it will bring no immediate increase in the price of its products, and smaller steelmakers are likewise expected to absorb the cost.

Most local foundries, however, are reported to have passed on the increase by anticipating it in the industry's recent general rise following the steel wage increase. Mo-Ill has attributed all its price rises to increasing costs of freight, labor and coal. An added factor was the necessity of major plant repairs which the company had to make on a risk basis, since it has no assurance of final ownership of its property. The company operated the furnaces for the Defense Plant Corp. during the war, and has now offered the government $3,255,000 for the property. The transfer, however, has been tied up in litigation.

**Boston**—Before Mystic furnace iron is again available, around Nov. 1, additional limited tonnages are expected from the Buffalo district, mainly from Wickwire Spencer's Steel Division stack recently blown in; other producers are scanning schedules with the hope of diverting some iron to New England, but the total will be small in view of the demand against low inventories in other districts. The Wickwire Spencer stack has a daily capacity of 400 tons, but only a part will come into this area. While Mystic is down a complete overhaul and repair job will be done, including stoves and accessories. Many of the 240 steel wearing plates and 211 copper cooling plates have been salavaged.

**Pittsburgh** — No improvement in critical shortage of merchant pig iron is expected through remainder of this year by leading foundry interests. Pittsburgh Steel Co. will have additional blast furnace capacity available late this quarter, but increased hot metal available will be utilized to fullest extent possible in order to lessen reliance on scrap purchases as much as possible. Merchant stacks continue to lose about 10 per cent of rated capacity melt because of poor quality coke and other production difficulties resulting from continued operation without adequate maintenance. One factor somewhat offsetting present pig iron shortage is reported easing in demand for gray iron, steel and malleable castings.

Pittsburgh Metallurgical Co. on Aug. 20 advanced electric furnace silvery pig iron $3.00 per ton, f.o.b. Niagara Falls, N. Y.

New Jersey Zinc Co. advanced spiegeleisen $5 per gross ton to $57 at Palmerton, Pa., for 19-21 per cent manganese grade. Carnegie-Illinois Steel Corp. continues to quote $56 at Pittsburgh and Chicago furnaces.

**Philadelphia** — To the extent production is getting up to capacity with shipments heavier, pig iron melters are benefiting by return to blast by the Swedeland, Pa., furnace.

However, with inventories low, scrap ratios in melts are high, and foundries are pressing for more tonnage. Considerable foreign iron is offered, $80 ton and up with some bought, including soil pipe requirements.

**New York**—Heavier allocations of pig iron to heating and pipe shops is generally at the expense of other foundries not included in the voluntary distribution program, resulting in some dislocation of shipping schedules. With demand strong and supply limited, inventories are low. Foreign iron is freely offered at $80 to $100 per ton and some is being bought, notably in New England. Tonnage is not as large as appears on the surface, the same lot frequently being offered by several agents. Ratio of scrap in melts ranges up to 80 per cent and ferrosilicon sales are brisk for the reduction of hardness in castings. Yet rejections are abnormally high.

**Cincinnati**—Allotments of pig iron, both northern and southern, for this district are virtually unchanged from earlier months this year. However, deliveries are keyed to production and it is evident furnaces are not yet able to fulfill commitments. Foundries are trying to expand the melt which sagged during July because of vacations and other reasons, but they are making slow headway in this direction due to shortages of iron.

**Birmingham** — Pig iron distribution continues to be spread rather thinly as melters attempt to supply as many users as possible with at least a portion of their requirements.

## Metallurgical Coke . . .

Metallurgical Coke Prices, Page 124

**Pittsburgh**—Independent coke operators have found it necessary to raise Connellsville beehive furnace coke prices an additional 50 cents a net ton to offset increased operating costs. Bulk of spot sales are reported at $15.50, with contract price of $13.50 holding unchanged. A few spot sales have been noted above $15.50. A further increase in production costs is a possibility on the basis of the recent decision of railroads to petition ICC for an increase of 25 cents per ton in coal and coke freight rates. A 20-cent per ton advance also is being sought on iron ore freight rates. Demand has eased somewhat for foundry coke, reflecting vacation shutdowns and the critical scarcity of pig iron. A substantially sharper drop in demand is reported for metallurgical coal, with mills reportedly liquidating stocks of poorer grades purchased from outside sources at the time of the coal strike threat early this summer.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 122

### Carnegie revises fabricated reinforcing bar mill price and extras

**Pittsburgh**—Carnegie-Illinois Steel Corp. has established a $4.25 per 100 pound mill price and has made an upward revision in bending and engineering extras on fabricated concrete bars, effective Aug. 18. Industry is generally quoting $4.25 as price base for fabricator bars, a spread of $18 per ton as compared with $15 formerly.

Light bending extras have been increased 25 cents, to $1.75 per 100 pounds; heavy bending, 10 cents to 65 cents. Definition of light bending has been revised to read as follows: includes all ¼-inch and ⅜-inch bars, all ½-inch stirrups and column ties and bars of any size bent at more than six points; all bars bent more than one plane and all radius bending with more than one radius in any bar, or a combination with more than one radius in any bar, or a combination of radius and other type bending. The following has been inserted in the definition of heavy bending: Radius bending with only one radius in an individual bar. Designing extra has been increased 10 cents, to 50 cents per 100 pounds. Detailing and listing extras have been revised as follows: 500 tons or over, 35 cents; under 500 tons to 200 tons, 40 cents; under 200 tons to 20 tons, 50 cents; under 20 tons to 5 tons, 60 cents; under 5 tons, 75 cents. Minimum charge on any order is now $15, up $5. Listing extra only is increased to 10 cents.

**Chicago** — Demand for reinforcing bars and other concrete reinforcement continue to exceed steel supply by a wide margin, and, as a result, there is no spirited competition between suppliers for new construction work offered.

**Seattle**—Demand for mill products exceeds capacity of plants which are struggling under heavy backlogs. One reinforcing bar mill is refusing new business until unfinished orders are reduced.

## Warehouse . . .

Warehouse Prices, Page 125

**Boston**—Steel users, with fourth-quarter allocations again lower, can expect no relief from warehouses because distributors are in the same boat as regards carbon products for which demand is heaviest and far in excess of supply. The steel warehouse price structure is mixed and distributors are concerned as to developments toward the elimination of jobber discounts on stainless, effecting sheets, strip, wire and bars.

**Pittsburgh**—The latest price action by warehouse interests involves establishment of a $6.15 price on cold-finished flats, 6 inches and narrower, and on cold-finished squares, 3/16 to 4 inches, inclusive. This represents an increase of 50 cents per 100 pounds over the $5.65 price formerly quoted for all cold-finished bar classifications.

One distributor has raised his galvanized sheet prices to $7.05 per 100 pounds for 10-gage base, in line with the majority of other interests here.

**Seattle**—All fabricated items show an increase with new quotations as follows in cents per pound: Hot-rolled sheets, 6.35; cold-rolled sheets, 7.90; galvanized sheets, 8.40; hot-rolled strip, 6.70; hot-rolled bars (rounds), 6.20; cold-finished rounds, 8.15; hot-rolled alloy bars (4140), 9.45; carbon plates, 6.35; floor plates, 8.40; structural shapes, 6.30.

## Ferroalloys . . .

Ferroalloy Prices, Page 125

**New York** — Spiegeleisen was advanced $5 ton f.o.b. Palmerton, Pa., by New Jersey Zinc Co. to $57 for the 19-21 per cent grade.

**Philadelphia**—E. J. Lavino & Co. have shifted their price on ferromanganeses from a seaboard to a furnace base, although quoting the same figure. The company is quoting, effective Aug. 9, $145 per ton at Sheridan, Pa., and Lynchburgh, Va., furnaces.

**Wenatchee, Wash.** — War Assets Administration has received two bids on the ferroalloys plant at Rock Island, Wash. Keokuk Electro-Metals Co., Keokuk, Ia., offered $382,000 for operation of the unit in place. American Chrome & Magnesium Industries Inc., Washington, D. C., offered to lease for five years on terms of 5 per cent of gross sales.


HEVI DUTY ELECTRIC COMPANY

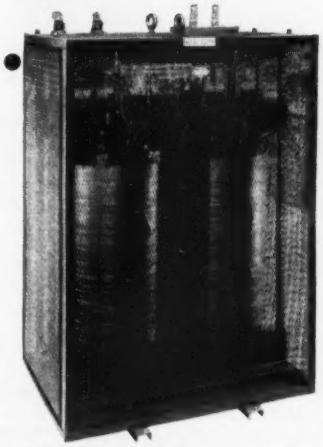
Surges

DRY TYPE

INDOOR DISTRIBUTION

TRANSFORMERS

(Sizes ¼ to 1000 KVA)



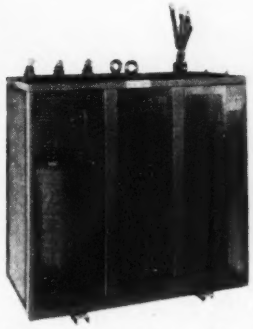
250 KVA — Single Phase — 60 Cycle — 2400-480 Volt with four 2½% taps below 2400 Volts and with bus bar secondary terminals.

AVAILABLE in standard models or designed specifically for your application. Rugged construction with generous use of materials provide long life and trouble free service.

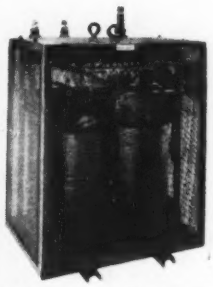
★ Use Surges Dry Type Indoor Distribution Transformers for *Safety*.

★ Eliminate Expensive vault construction.

★ No inflammable liquids.



150 KVA — 3 phase — 60 cycle — 2400-120/208 volt — 4 wire. For lighting or light power loads.



100 KVA — Single Phase — 60 Cycle — 2400-480 Volt with four 2½% taps below 2400 Volts. Taps are accessible through a covered opening in the top.

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**HIGH** TENSILE STRENGTH
ELASTIC LIMIT
RESISTANCE TO FATIGUE
RESISTANCE TO CORROSION
RESISTANCE TO WEAR

## Scrap . . .

Scrap Prices, Page 128

**Pittsburgh**—Mills' scrap inventories are in fair shape, based on reported closer adherence to specifications on incoming shipments. One large mill has stopped shipment on No. 2 bundles due to poor quality and more recently rejected a number of cars of heavy melting. Flow of dealer scrap, has been very light recently.

Trade interests are unwilling to make large tonnage forward commitments at present levels for other tonnage than on hand. Mills generally adhere to $2.50 springboard, but some tonnage is reported moving here on up to $3.50 freight. Published scrap quotations frequently do not reflect levels at which significant scrap tonnage is moveing due to large amount of reciprocity scrap shipments and growing proportion of ingot conversion arrangements. Ingot conversion deals in particular have been anything but a stabilizing influence on scrap quotations and also have accentuated the tight available supply situation existing in dealer scrap. There are no longer available adequate open market transactions to accurately gage representative scrap values.

Some machinery cast recently was purchased at $73 and No. 1 cupola at $66. A slight easing in rail scrap prices is noted. Reverse is true of railroad specialties, with some tonnage on latest Pennsylvania Railroad list going above $60.

**Buffalo**—Steady strength pervaded the scrap market last week as dealers continued to ship against current contracts. Standing bids within prevailing ranges were reported on the waiting list for dealers to renew orders when present ones are completed. Leading mill consumers are able to add slightly to reserve stocks. However, up to this point replenishment of stockpiles has not been adequate to eliminate apprehension over ingot operations during the winter months.

Although new business has been negligible, cast prices held at the sharply advanced prices which were established by a substantial sale two weeks ago.

**New York**—Open-hearth grades are steady with turnings inclined to low side. Demand for machine shop and short shoveling turnings from eastern Pennsylvania is slower with the bulk going to the Pittsburgh area and both are 50 cents lower. Wide range of prices prevail for malleable with as high as $80 ton paid.

**Boston**—More No. 1 heavy melting steel is moving at the old formula $34.40 shipping point, although some is selling $2 above that price which, however, never disappeared entirely. Light steel scrap is unchanged. Cast scrap is strong with foundries increasing scrap melt to the limit due to shortage of pig iron. On some grades, outside buying at prices above district consumer bids tends to maintain top price ranges.

**Philadelphia** — Early and heavier arrival of foreign steel scrap at Philadelphia and Baltimore is taking the edge off buying pressure with prices generally unchanged throughout the list. On the way to Baltimore is the first shipment of 250,000 tons from Germany for Bethlehem Steel Co. and additional tonnage is due for other interests. Negotiations having been closed, scrap from Germany is being shipped more promptly than expected. Three or four cargoes are due in Philadelphia within next week or two and additional tonnage may go to New York and Boston. This scrap was reported to have been acquired for around $43 a ton which, with $2.50 stevedore charges, puts the price within range of domestic quotations.

**Detroit** — Demand for low-phos plate scrap is strong and should accelerate further with installation of new electric furnace melting capacity in this area as now planned. Generally, the scrap market is quieter with some slowing noted in "high-price" deals which had been prevalent over past months. Slight increases are noted in the movement of foundry scrap, although the price is steady, brokers buying at about $56 per ton.

**Birmingham** — An increase of $2 in posted price of heavy melting, bringing current quotations to $39.50, was disclosed in the local scrap market last week. Volume of scrap is fairly heavy but little is showing up from agricultural sources.

**St. Louis** — A strong undertone continues in the scrap market, although prices held unchanged last week. Pressure on cast grades has increased since the district's principal supplier of pig iron halved its production.

**Seattle**—In view of other price advances and the firmness of the scrap market, steel scrap likely will be advanced in the immediate future. Dealers are demanding more and buyers admit it may be necessary to meet eastern competition again in this area seeking choice tonnages.

Foundries report no worries over cast iron scrap which is being consumed in larger tonnages because of the scarcity of pig iron. Scrap is nominally $40 although purchases above that level have been reported.

## Canada . . .

**Toronto, Ont.** — Canadian sheetmakers had advanced prices on both hot-rolled and galvanized sheets, the former up 20 cents to $3.60 and the latter 50 cents to $6.05 per 100 pounds. The sharp jump in the price of galvanized is credited to the recent advance of 3 cents per pound in zinc. Producers did not advance sheet prices when other lines of steel were moved up last June, following approval of advances by Wartime Prices and Trade Board, but steadily advancing costs made it necessary to take action at this time, officials of producing companies point out. No further changes have been announced for other steel materials, although increases have been made in extras on various lines of alloy steels.

Steel production in Canada has been somewhat curtailed and output for July and August will run below the high record made in May, largely due to shut downs of steel plants for the two-week summer holidays. However, it is understood that production schedules again are being stepped up and will be at virtual capacity for the remainder of the year. There has been no easing in

the supply situation.

Demand for merchant pig iron is absorbing all available supply, and producers are feeding melters about 10,000 tons weekly, of which foundry iron accounts for about 6000 tons; malleable, 2000 tons and basic 1500 tons. Production is holding close to the year's average, with 12 of the 14 furnaces in Canada blowing. Prices are firm as follows: Base grade, 2.25 silicon and under, $43.50; malleable, $40; basic, $43.50, delivered per gross ton, Toronto.

Local dealers report slowing down in scrap receipts. Most of the offerings are from industrial plants with only occasional shipments reported from the rural communities. The scrap situation as a whole, insofar as Canadian supplies are concerned, is critical with domestic scrap supplying less than 40 per cent of requirements.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

4545 tons, manufacturing building, Western Electric Co. Inc., Indianapolis, to R. C. Mahon Co., Detroit.

2800 tons, alterations, Richmond station, Philadelphia Electric Co., Philadelphia, to American Bridge Co., Pittsburgh.

2046 tons, penstock, spec. 2278, Coram, Mont., for Bureau of Reclamation; 1573 tons to Chicago Bridge & Iron Co., Chicago, and 473 tons to Pacific Coast Engineering Co., Alameda, Calif.

1200 tons, power plant and substation, Northern States Power Co., Red Wing, Minn., to Bethlehem Steel Co.

1100 tons, exchange addition, New Jersey Bell Telephone Co., Newark, N. J., to Bethlehem Steel Co

820 tons, bus garage, Flatbush, Brooklyn, N. Y., to Harris Structural Steel Co., New York; Washauer Construction Co., general contractor.

760 tons, mill building, Sloane-Blabon Corp., Trenton, N. J., to Bethlehem Steel Co.; Walter Kidde Construction Co., general contractor.

630 tons, Carbide & Carbon Chemicals Corp., Institute, W. Va., to Bethlehem Steel Co.

585 tons, mill building, Mundet Cork Corp., North Bergen, N. J., to Bethlehem Steel Co.

550 tons, diesel service building, Chicago, Milwaukee, St. Paul & Pacific railroad, Minwaukee, to American Bridge Co., Pittsburgh.

450 tons, alterations to freight terminal, Chicago Union Station Co., to American Bridge Co., Pittsburgh.

365 tons, three span stringer state bridge, Beverly, Mass., to Bethlehem Steel Co.; DeMatteo Construction Co., Quincy, Mass., general contractor.

360 tons, Dairyland Power & Co-operative, Alma, Wis., to Duffin Iron Co., Chicago.

300 tons, bridge, S 0146(1), Palisade, Colo., to Midwest Steel & Iron Works Co., Denver.

300 tons, state highway bridge, route S-3, Clifton-Passaic, N. J., to Bethlehem Steel Co.; Franklin Contracting Co., general contractor.

300 tons, shop buildings, Texas Co., Westville, N. J., to Bethlehem Steel Co.

290 tons, bridge 6546, Carlton, Minn., for State Highway Department, to American Bridge Co., Pittsburgh.

266 tons, bridge 6563, Wabasha county, Minn., for State Highway Department, to American Bridge Co., Pittsburgh.

250 tons, repairs to LaSalle St. Station, Chicago, for Chicago, Rock Island & Pacific railroad, to Duffin Iron Co., Chicago.

250 tons, garage, Metropolitan Transit Authority, Boston, to A. O. Wilson Structural


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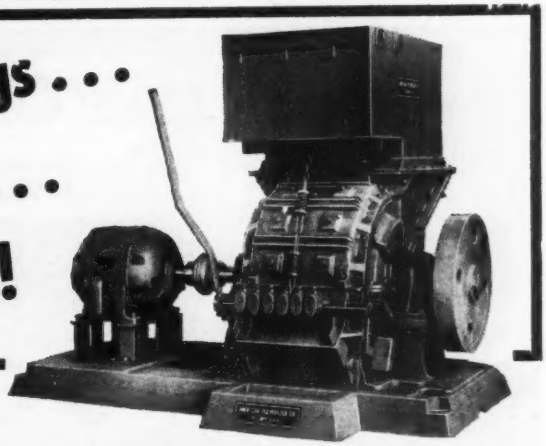

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Co., Cambridge, Mass.; J. J. Powers, Cambridge, general contractor.

235 tons, state highway bridge, Delaware county, Pennsylvania, to American Bridge Co., Pittsburgh, through G. A. & F. M. Wagman, constructors.

230 tons, store buildings, Levitt Co., Levittown, N. Y., to Bethlehem Steel Co.

225 tons, school, Braintree, Mass., to O. A. Wilson Structural Co., Cambridge, Mass.; Walsh Bros., Cambridge, general contractor.

200 tons, Washington state Nooksack bridge, to Poole, McGonigle & Dick, Portland, Oreg.; Clark Eldridge, Tacoma, general contract, $179,277.

200 tons, garage, Cushman & Sons, Long Island City, N. Y., to Bethlehem Steel Co.

195 tons, building, Van Cleef Bros., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

167 tons, bridge, 6679, Houston, Minn.; for State Highway Department, to Illinois Steel Bridge Co., Jacksonville, Ill.

160 tons, turbine generator foundation, Connecticut Light & Power Co., Devon, Conn., to American Bridge Co., Pittsburgh, through United Engineers & Constructors Inc., Philadelphia.

156 tons, bridge ERS 17(5), Page County, Iowa, for state, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

140 tons, addition, Lebanon Steel Foundry, Lebanon, Pa., through Hughes Foulkrod & Co., Philadelphia, to Bethlehem Steel Co.

140 tons, addition, Lebanon Steel Foundry Co., Lebanon, Pa., to Bethlehem Steel Co.

125 tons, state bridge, Newburyport-Salisbury, Mass., to American Bridge Co., Pittsburgh; F. W. Byron, Dedham, Mass., general contractor.

123 tons, building, Blockson Chemical Co., Joliet, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

100 tons, warehouse, General Mills Inc., Chicago, to Duffin Iron Co., Chicago.

100 tons, cinder hopper, Corona, N. Y., to Jones & Laughlin Steel Corp., Tully & DeNapoli, New York, general contractor.

### STRUCTURAL STEEL PENDING

3700 tons, superstructure, state bridge, Housatonic river, Shelton-Derby, Conn.; former bid rejected, to be readvertised.

2000 tons, mill building, 30-inch strip mill; Alan Wood Steel Co., Conshohocken, Pa.. United Engineers & Constructors Inc., Philadelphia, general contractor.

1700 tons, extension, Market St. subway, Philadelphia; bids Sept. 2.

1160 tons, overpass, Elsmere, Del.; bids Sept. 15 to State Highway Department.

800 tons, state bridge, Washington county, Pennsylvania; bids in.

450 tons, Oregon highway 535-foot span; general contract to Don L. Cooney, Seattle, low $318,320.

260 tons, state bridge, 138' 4" clear span solid floor deck plate girder, to carry New Haven railroad tracks over U. S. route 1, Stonington, Conn.; bids Aug. 23, Hartford.

200 tons, elementary school, Philadelphia; bids Aug. 26.

200 tons, hospital, St. Albans, Vt.; general contract bids in.

100 tons, skew span composite girder bridge, East Lyme, Conn.; bids Aug. 23, Hartford.

100 tons, Ashland Shirt Co., Ashland, Pa.; bids Aug. 24.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

310 tons, stadium, Franklin Park, Boston, to Bethlehem Steel Co.; C. J. Maney Co. Somerville, Mass., general contractor.

150 tons, state bridge, Beverly, Mass., to Bethlehem Steel Co.; DeMatteo Construction Co., Quincy, Mass., general contractor.

### REINFORCING BARS PENDING

2350 tons, concrete dam and power house, Missouri Basin project, near Helena, Mont.

1795 tons, earthfill dam, Missouri Basin project, Republican river, near Hale, Colo.

550 tons, earthfill dam, Missouri Basin project, near Lemmon, S. Dak.

340 tons, substructure, bridge, Housatonic river, Shelton-Derby, Conn.; Mariani Construction Co., general contractor.

288 tons, University of Washington music building, Seattle; Strand & Sons, Seattle, general contract, low $1,099,226.

140 tons, overpass, Linden branch location, Linden, N. J.; bids Aug. 24, State Highway Department, Trenton.

100 tons, highway route 25(1927) from route S-26 to Deans, Middlesex county, New Jersey; bids Sept. 2, Trenton.

100 tons, Washington state bridge, Okanogan county; bids to Olympia, Aug. 27.

Unstated, $6 million library expansion project, Seattle; bids for first unit in October; previous bids rejected.

## PLATES . . .

### PLATES PLACED

2500 tons, tanks, Texas Co., West Tulsa, Okla., to Bethlehem Steel Co.

### PLATES PENDING

Unstated, six small vertical oil storage tanks; bids to Bureau of Reclamation, Denver, Sept. 9; No. 2362.

Unstated, two 100,000-gallon water tanks, one 250,000-gallon tank on 80 and 100-foot towers; steel, alternative wood; bids to U. S. Engineer, Portland, Oreg., Aug. 26; first bids rejected.

## PIPE . . .

### CAST IRON PIPE PLACED

350 tons, water main, including 950 feet 12-inch, 6825 feet 10-inch, 6125 feet 8-inch, 1700 feet 6-inch and 250 feet 4-inch, Village of Lyons, Ill., to James B. Clow & Sons, Chicago; Sam Cerniglia Co., Melrose Park, Ill., contractor.

134 tons, various sizes, for Seattle and Bremerton, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

## RAILS, CARS . . .

### LOCOMOTIVES PLACED

New York, Chicago & St. Louis, nine 1000 hp diesel-electric switchers to Fairbanks, Morse & Co. and four to Lima-Hamilton Corp.

### RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 200 seventy-ton covered hoppers, to General American Transportation Co., Chicago.

Delaware & Hudson, 100 seventy-ton covered hoppers to Greenville Steel Car Co., Greenville, Pa.

Detroit, Toledo & Shore Line, 100 seventy-ton covered hoppers, to General American Transportation Corp., Chicago.

Illinois Central, 750 fifty-ton hopper cars, to General American Transportation Corp., Chicago; 500 fifty-ton hoppers to Pressed Steel Car Co., McKees Rocks, Pa.; 1750 fifty-ton hoppers to Pullman-Standard Car Mfg. Co., Chicago; 100 seventy-ton covered hoppers to General American Transportation Corp., Chicago.

Minneapolis, St. Paul & Sault Ste. Marie, 550 ton box cars, to own shops.

Pittsburgh & West Virginia, 600 fifty-ton hoppers, to Pressed Steel Car Co., McKees Rocks, Pa.; 200 fifty-ton gondolas, to Bethlehem Steel Co.

Virginian, 1000 fifty-five-ton hoppers, to Pressed Steel Car Co., McKees Rocks, Pa., 500 fifty-ton hoppers to own shops; 25 caboose cars, to St. Louis Car Co.

Wabash, 100 fifty-ton box cars, to own shops.

### RAILROAD CARS PENDING

Duluth, South Shore & Atlantic, 100 fifty-ton box cars and 100 fifty-ton gondolas.

Die for blanking 16-gauge steel sheet (die illustrated has already run approximately 2,000,000 blanks) . . . machined to tolerances of ± .002" in HSC 265 air hardening alloy steel . . . preferred for its unusual wearing qualities, its machinability, its resistance to warping and distortion in heat treating.

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# CONSTRUCTION AND ENTERPRISE

## ALABAMA

BIRMINGHAM, ALA.—Birmingham Gas Co. will build a $600,000 operating and service center between Third and Fifth Aves. S.

## FLORIDA

JACKSONVILLE, FLA.—Dowell Inc., Girard Trust Co. Bldg., Philadelphia, will build chemical storage tanks and warehouses costing $200,000 at Commodores Point, East Jacksonville.

JACKSONVILLE, FLA.—Merrill-Stevens Dry Dock & Repair Co., E. Bay St., will build redredging and outfitting basins at Old St. John's shipbuilding plant and a dry dock and pier at the Riverside Yards, costing $350,000.

JACKSONVILLE, FLA.—Turpentine & Rosin Factory, Atlantic National Bank building, will build a $200,000 turpentine distillation plant for oleoresin, turpentine and rosin.

## GEORGIA

ATLANTA, GA.—Grinnell Co., c/o W. H. Armstrong, engineer, 732 Peachtree St., has awarded a $100,000 contract to Jiroud Jones, Walton Bldg., for construction of a cabinet shop and locker room facilities.

COLUMBUS, GA.—Charles Williams & Associates have purchased the $2,300,000 gas business of George Power Co., Columbus and Americus.

CORNELIA, GA.—Chicopee Mfg. Corp., c/o Robert & Co., Bona Allen Bldg., Atlanta, has awarded a $75,000 contract to A. K. Adams, 542 Plum St., N. W., Atlanta, for erection of a lumite plant addition.

## INDIANA

CONNERSVILLE, IND.—American Central Div., Arco Mfg. Corp., W. Eighteenth St., has awarded a $275,000 contract to Austin Co., 16112 Euclid Ave., Cleveland, for an addition to its factory.

EVANSVILLE, IND.—Seeger Mfg. Co., Walter Seeger, president, Morgan Ave., is contemplating making a $400,000 addition to its mechanical refrigerator manufacturing plant.

EVANSVILLE, IND.—Bucyrus-Erie Co. is building a $95,000 office building; Ryan Construction Co., contractor.

VEVAY, IND.—U. S. Shore Corp., 1658 Herald St., Cincinnati, has awarded a $150,000 contract to Lubrecht Construction Co. for erection of a shoe factory.

## KANSAS

KANSAS CITY, KANS.—Chicago, Rock Island & Pacific Railroad, F. W. Thompson, chief engineer, La Salle St. Station, Chicago, is planning to build a $2 million freight yard.

KANSAS CITY, KANS.—Procter and Gamble Mfg. Co. has awarded a $750,000 contract to H. K. Ferguson Co., Cleveland, for the construction of a plant building at 19th and Hanses Sts.

## LOUISIANA

SHREVEPORT, LA.—Texas Eastern Transmission Corp. has applied to Federal Power Commission for authority to perform construction which will cost about $24 million.

SPRINGHILL, LA. — Consolidated Chemical Inc,. San Francisco, has awarded a $250,000 contract to Austin Co., Cleveland, for a chemical plant.

WATERPROOF, LA.—The town, S. H. Webb, mayor, is planning a complete gas distribution system; Pan American Engineers, 1418 Third St., Alexandria, engineers.

## MICHIGAN

ANN ARBOR, MICH. — O'Connor Machine Works Inc., 1330 Lake Shore Drive, has been formed by Olaf W. Erickson, 1221 Baldwin, with a capital of $300,000 to make gen-

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eral machinery for concrete and abrasive manufacturing.

DETROIT — Detroit Transmission Division, General Motors Corp., is planning to build a new manufacturing unit on Plymouth Rd. which will function as a feeder for the main plant.

GRAND RAPIDS, MICH.—Grand Rapids Plating Co. Inc., 1140 Monroe, has been formed by Raymond N. Brach, 301 Sligh Blvd. N. E., with a capital of $300,000 to engage in the plating, buffing and foundry business.

## MISSOURI

INDEPENDENCE, MO.—The city, Roger T. Sermon, mayor and James Craig, city clerk, will receive bids August 30 on the construction of additions and alterations to the municipal power plant, and on power piping, insulation, ducts and breeching, and power wiring; Black and Veatch, 4706 Broadway, Kansas City, consulting engineers.

LAMAR, MO.—Barton County Memorial Hospital plans to construct a $230,000 building on Gulf St.; D. R. Sandford and Sons, 325 Woodruff Bldg., Springfield, architects.

ST. LOUIS—Pullman Co., 5550 Bircher Blvd., has awarded a contract to William H. & Nelson Cuhliff Co., 3320 Lindell Blvd., for construction of an addition to its storage building; Fred S. McNeil, 3320 Lindell Blvd., architect.

ST. LOUIS—Continental Boiler & Sheet Metal Works, 4569 Duncan Ave., has awarded an $80,000 contract to G. L. Tarlton Contracting Co., 5505 Dale Ave., for construction of a shop and office building at 5601 West Park Ave.; Arthur B. Rathbert, 3615 S. Grand Blvd., architect, and Leslie J. Bergmeier, 1504 S. Grand Blvd., structural engineer.

## NEW JERSEY

DOVER, N. J.—Hercules Powder Co., Kenvil St., has awarded a $150,000 to $200,000 contract to Wm. B. Huxster, Dover Hills, for construction of nitrator buildings.

## NEW MEXICO

SAN JUAN, N. M.—San Juan Pipe Line Co., El Paso, Tex., is contemplating building a $1,750,000 natural gasoline extraction plant near here, a $325,000 three thousand h.p. compressor station, and a $750,000 gas dehydration plant.

## NEW YORK

GARDEN CITY, N. Y.—Newsday Inc., 283 Main St., Hempstead, has awarded a $180,000 contract to Irwin A. Bohan, 110 E. Graham Ave., Hempstead, for construction of an administration building.

SYRACUSE, N. Y.—Solvay Process Division, Allied Chemical & Dye Corp., has started construction of a $1 million research laboratory. H. K. Ferguson Co., Cleveland, is in charge of designing and constructing the project.

## NORTH DAKOTA

GRAND FORKS—Minnkota Power Cooperative, plans to build a $225,000 steam power plant.

## OHIO

AKRON—B. F. Goodrich Co., T. G. Graham, vice president, 500 S. Main St., will start construction of a multi-million dollar plant for the manufacture of industrial rubber belting.

CLEVELAND—Eaton Mfg. Co., Heater Division, C. C. Bradford, vice president, E. 65th & Central Ave., is expanding its plant at an expenditure of $250,000. The division manufactures automobile heaters and defroster units.

CLEVELAND — Metals Research Associates Inc., has been chartered through John L. Dampeer, attorney, 1122 Guardian building. The firm expects to engage mainly in research in the metallurgical field.

## PENNSYLVANIA

ERIE, PA.—General Electric Co., 2901 E. Lake St., plans to construct a $4 million refrigerator storage and shipping warehouse; Frank D. Carey, resident engineer.

PITTSBURGH — Chemical Plants Division, Blaw-Knox Co., has received a subcontract for engineering and procurement services on a soybean extraction plant to be erected at Decatur, Ill. for Spencer-Kellor & Sons Inc. This project is part of a $3 million expansion program. Acting as process engineers to the Crosby Construction Co., Chicago, Blaw-Knox will supply a full complement of process equipment including extractors, pressure toasters, deodorizers, vapor desolventizers, and Lewis flaking mills.

## UTAH

GARFIELD, UTAH—American Smelting & Refining Co., Pacific National Life building, Salt Lake City, plans to build a $7 million acid plant.

# PRICES OF LEADING FERROALLOYS PRODUCTS

(Concluded from Page 125)

**c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.**

**Ferromanganese Briquets:** (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ⅝ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

**Silicon Briquets:** (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. (Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

### CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

### VANADIUM ALLOYS

**Ferrovanadium: Open Hearth Grade** (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

**Vanadium Oxide:** All Zones, contract, less carload lots, $1.20 per lb of contained $V_2O_5$. Spot, add 5c.

**Grainal:** Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

### TITANIUM ALLOYS

**Ferrotitanium:** (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

**Ferrotitanium, High-Carbon:** (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

### TUNGSTEN ALLOYS

**Ferrotungsten:** (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

**Tungsten Powder:** (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

### ZIRCONIUM ALLOYS

**12-15% Zirconium Alloys:** (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

### BORON ALLOYS

**Ferroboron:** (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more, 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

**Borosil:** (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

**Bortam** (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

**Carbortam:** (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

### OTHER FERROALLOYS

**Ferrocolumbium:** (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

**CMSZ Mixes:** (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

**Silcaz Alloy:** (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

**Graphidox No. 4:** (Si 56%, Ca 5%, Ti 9%) C.l. packed, 16.50c per lb. of alloy; ton lots 17.90c; less ton lots 19.40c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

**V-5 Foundry Alloy:** (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%) C.l. packed, 12.95c per lb. of alloy; ton lots 14.60c; less ton lots 15.85c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

**Simanal:** (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

**Ferrophosphorus** (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

**Ferromolybdenum:** (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.